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ABSTRACT

A study involving 39 retarded (24 to 92 months old) and 61 nonretarded (18 to 54 months old) children was designed to determine what fundamental social cognitive skills young retarded children possess, to describe the characteristics and developmental factors of such skills, and to determine whether previous findings on the development of these skills in young nonretarded children are replicable in a broader socioeconomic sample. Using teachers as informants, a social age and social quotient was obtained for all children from the Vineland Social Maturity Scale. A teacher estimation of each child's social maturity was also obtained. Each child was administered 23 communication tasks which were essentially nonverbal and involved three skill domains: percept production, or the ability to produce a visual percept for another person, i.e., showing; percept deprivation, or the ability to remove a visual percept from another person, i.e., hiding; and percept diagnosis, or the ability to determine what another person was attending to visually. Findings indicated that young retarded children are aware of other people's acts and abilities. Appendixes include a summary of social intelligence measures, a skills checklist, a description of tasks and procedures, a sample communication tasks protocol, and tables showing strategies of Ss. (SBH)

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Final Report

Project No. 13.443
Grant No. 443AH80087

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DIAGNOSTIC AND COMPARATIVE STUDY OF FUNDAMENTAL COMMUNICATION SKILLS IN YOUNG RETARDED AND NONRETARDED CHILDREN

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Office of Education
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JANET BLACHER-DIXON. Social Cognition in Early Childhood: A Study of Fundamental Communication Skills in Young Retarded and Nonretarded Children (Under the direction of RUNE J. SIMEONSSON.)

Communication and role-taking skills are considered important factors in determining a child's social competence. For young retarded children, these skills may be particularly important in determining their success in blending into mainstreamed or integrated environments. The present study explored the development of these skills in young retarded and nonretarded children within the theoretical and empirical framework associated with social cognition. In this context, communication and role-taking were viewed as being both cognitive and social components of social competence.

The major purpose of this study was threefold: (1) to determine what fundamental social-cognitive skills young retarded children possess; (2) to describe the characteristics and developmental factors of such skills; and (3) to determine whether previous findings on the development of these skills in young nonretarded children are replicable in a broader socioeconomic sample. The 39 retarded subjects selected for the study ranged in chronological age from 24 to 92 months ($\bar{x}$ = 55.6) and in mental age from 7 to 45 months ($\bar{x}$ = 28.6). The 61 nonretarded children selected for the study ranged in chronological age from 18 to 54 months ($\bar{x}$ = 37.7). All nonretarded children included in this study attended either some form of preschool or day

care, and all the retarded children attended developmental day care centers.

Using teachers as informants, a social age and social quotient was obtained for all children from the Vineland Social Maturity Scale (Doll, 1953). A teacher estimation of each child's social maturity was also obtained using an instrument developed specifically for this study. Each child was administered 23 communication tasks based on the materials developed by Lempers, Flavell, and Flavell (1977). These tasks were essentially nonverbal and involved three skill domains: (1) percept production, or the ability to produce a visual percept for another person, i.e., showing; (2) percept deprivation, or the ability to remove a visual percept from another person, i.e., hiding; and (3) percept diagnosis, or the ability to determine what another person was attending to visually.

Results of the study demonstrated that:

(1) Young retarded children can be assessed in the areas of role-taking and social communication using appropriate materials with limited task demands.

(2) Retarded children are not restricted to the use of any single strategy, but utilize a wide variety of strategies in responding to task demands.

(3) The performance of both mentally retarded and nonretarded children appears to be related to social age level, such that children at social age level two received "no credit" for most of their responses to the tasks, children at social age level four received "complete credit" for most of their responses to the tasks, and children at social age level three were intermediate, i.e., their responses were typically scored either "partial credit" or "complete credit."

(4) The emergence of the social communication skills assessed appears to conform to a developmental pattern characterized by a hierarchical sequence from simple to more complex forms.

(5) Guttman scalogram analyses produced significant coefficients of reproducibility for the five items in the percept deprivation domain and for the three items in the percept diagnosis domain for both retarded and nonretarded groups.

(6) Multiple scalogram analyses of the fifteen percept production items indicated that they did not reliably fit one scale for either the retarded or nonretarded groups. However, nine of the fifteen items did form a reliable scale for the nonretarded group only.

(7) In further exploring the relationship between social age and communication task performance in each of the three domains (percept production, percept deprivation, percept diagnosis), correlation coefficients were computed. For both the retarded and nonretarded groups, social age was significantly related to total scores on percept production, percept deprivation, and percept diagnosis items.

(8) For the nonretarded group only, correlation coefficients between total communication task performance and chronological age were computed, indicating significant associations between chronological age and total scores on percept production, percept deprivation, and percept diagnosis items.

(9) The findings with nonretarded 2-, 3-, and 4-year-old children replicate some general findings of an earlier study (Lempers et al., 1977) using nonretarded 1-, 2-, and 3-year-old children. In the present study, the 2-year-olds primarily gave responses that received "no credit," the 3-year-olds primarily received "partial credit" for their responses, and the 4-year-olds primarily received "complete credit" for their responses to most of the tasks.

The findings of this study demonstrate that young retarded children, at the social ages of two, three, and four, are aware of other people's acts and abilities. The replicability of earlier findings with nonretarded children further attests to the diagnostic utility of these tasks. Some potential uses of the tasks include: (1) development of a criterion-referenced checklist approach to assessing social-cognitive development in young retarded children; (2) the development of curriculum materials to enhance social competence and awareness; and (3) the implementation of systematic training in fundamental communication or social-cognitive skills.

TABLE OF CONTENTS

		Page
LIST OF FIGURES		iv
LIST OF TABLES		v
ACKNOWLEDGEMENTS		vi
Chapter		
I	INTRODUCTION TO THE DEVELOPMENT OF SOCIAL SKILLS	1
	Definitions and Conceptualizations	3
	Role-Taking	14
	Referential Communication	29
	Problems and Rationale	39
II	METHOD	45
	Subjects	45
	Subject Variables	48
	Child Characteristics	51
	Materials	51
	Procedure	52
III	RESULTS	67
	Study Purposes and Variables Reviewed	67
	Approaches to Data Analysis	67
	Results for Retarded Subjects	73
	Results for Nonretarded Subjects	83
	Post-Hoc Exploratory Analyses	99
	Data Summary	101

Chapter		Page
IV	DISCUSSION	104
	Interpretation and Significance of the Findings	104
	Study Limitations	109
	Issues and Questions Raised	114
V	CONCLUSIONS	117
	Implications for Research	117
	Implications for Practice	119
APPENDICES		
A	Summary of Social Intelligence Measures	121
B	Skills Checklist	124
C	Documentation of Retardation	127
D	Social Maturity Rank Protocol and Scoring Procedure	132
E	Sample Permission Letters to Parents	135
F	Description of Tasks and Procedures	139
G	Sample Communication Tasks Protocol	145
H	Strategies of 38 Retarded Children: Tasks 1-23 by Social Age	158
I	Strategies of 61 Nonretarded Children: Tasks 1-23 by Social Age	182
J	Strategies of 61 Nonretarded Children: Tasks 1-23 by Chronological Age	205
K	Information on the Vineland Social Maturity Scale	230
REFERENCE NOTES		239
REFERENCES		241

LIST OF FIGURES

Figure		Page
1	Toy Apparatus	54
2	Cumulative Pattern of Scalogram Analysis	70
3	Social Maturity Rankings for Retarded Subjects	76
4	Social Maturity Rankings for Nonretarded Subjects	87

LIST OF TABLES

Table		Page
1	Research Questions Associated with Social Cognition	12
2	Demographic Summary for Retarded Subjects	47
3	Demographic Summary for Nonretarded Subjects	49
4	Tasks Used in the Present Study	53
5	Detailed List of Scoring Codes	59
6	Grouping Variables: Retarded Subjects	74
7	Summary Table: Strategies of Retarded Subjects by Social Age	79
7A	Distribution of Communication Task Scores for Retarded Subjects	82
8	Results from Guttman Scalogram Procedure for Retarded Subjects	83
9	Multiple Scalogram Analysis of Percept Production Items for Retarded Subjects	84
10	Grouping Variables: Nonretarded Subjects	86
11	Summary Table: Strategies of Nonretarded Subjects by Social Age	89
11A	Distribution of Communication Task Scores for Nonretarded Subjects	93
12	Summary Table: Strategies of Nonretarded Subjects by Chronological Age	94
13	Results from Guttman Scalogram Procedure for Nonretarded Subjects	96
14	Multiple Scalogram Analysis of Percept Production Items for Nonretarded Subjects	98

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CHA.TER I

INTRODUCTION TO THE DEVELOPMENT OF SOCIAL SKILLS

The enactment of Public Law 92-142, the Education for All Handicapped Children Act, has resulted in the placement of mentally retarded children in increasingly less restrictive educational environments. In many instances this means total integration into mainstreamed settings containing both retarded and nonretarded children. In such integrated or mainstreamed settings, the mastery and utilization of interpersonal skills by retarded children is of critical importance for adjustment and acceptance (Edmonson, 1974; Greenspan, 1979). For many handicapped children, the failure to communicate with others in a socially competent manner becomes a significant problem in blending into the regular school classroom or into society in general; such failure in turn restricts further social integration. Thus, the ability to communicate socially, either through behavioral or verbal means, may be a significant factor in determining the child's success in blending into less restrictive placements.

Nonverbal communication in the form of expressive behavioral skills is thought to precede the development of more sophisticated forms of communication and social

awareness (Lee, Note 1; Lempers, Flavell & Flavell, 1977). Such basic skills include pointing, orienting, showing, and verbal responses. Later developments in interpersonal communication skills include how children differentiate themselves from others, and to what extent they are able to take into account another's feelings, intents, informational needs, or perspectives.

Recent research has shown that the nonretarded child, by two or three years of age, is aware of other people's acts and abilities. Such awareness has been documented by the possession of nonverbal as well as verbal communication skills in experimental (Lempers, Flavell & Flavell, 1977) and naturalistic (Wellman & Lempers, 1977) settings. There is, unfortunately, no comparable research on the development of social awareness in young retarded children. This lack of knowledge about early communicative development in young mentally retarded children seriously limits (1) efforts to evaluate preschool mainstreaming or intervention programs (Anderson & Messick, 1974), (2) the development of curriculum materials to enhance social competence and awareness, and (3) the implementation of systematic training in communication. The purpose of this study is to document social competence in children through the use of tasks and procedures developed within the framework of social cognition. Fundamental social communication skills will be assessed in young retarded children and young nonretarded children, with the goal of identifying the developmental features

of such skills.

In the following literature the need for a clearer understanding of the development of social competence and social awareness in mentally retarded children will be developed. The first section of this review will trace some previous attempts to conceptualize, define, and assess social competence. Particular emphasis will be placed on the utility of social cognition for operationalizing and researching aspects of social competence. The second and third sections of this review pertain to two components of social cognition--role-taking and referential communication. The final section identifies problems and issues related to research of this type as they pertain to the rationale for the present study.

Definitions and Conceptualizations

A number of conceptual approaches are available to research the development of skills which are socially determined. The concept of social competence represents one of these approaches. Research under the label of social competence, however, has often projected more commonality than actually exists. The concept itself has included such diverse areas as cognition, social relations, classroom or vocational adjustment, and mental health (Wenar, 1976), and has been based on research with subjects varying widely in age range. For example, there has been a considerable

amount of research on competence in infants (Bronson, 1974; Goldberg, 1977; Murphy & Moriarty, 1976; Rheingold, 1966, 1969; Shirley, 1931-1933; Stone, Murphy & Smith, 1973; Wenar, 1976; White & Watts, 1973). However, the focus of this research has more often included the development of factors such as motoric behaviors, personality, cognitive capacities, or affect, rather than the development of more social aspects of competence. On the other hand, specific attempts to study the development of social competence in preschool or school-age children have focused more directly on the actual social skills involved. As a means of heightening the understanding of social adaptation and interpersonal behavior of all children, the study of social competence has particular relevance for handicapped children and adults (Edgerton, 1967; Kleck, 1976; Simeonsson, 1978).

Social Competence

Historically, the concept of social competence has often been equated with skills measured by the Vineland Social Maturity Scale (Doll, 1953) or the Adaptive Behavior Scale (Nihira, Foster, Shellhaas, & Leland, 1974). Both of these instruments represent a "mixed bag" approach to the definition of social competence in that they assess a number of self-help, cognitive, linguistic, and social skills. Similarly, a number of other less well-known but available instruments purport to measure some aspect of social competence (Cain, Levine, & Elzey, 1963; Johnson, 1976; Kohn &

Rosman, 1972; Levine, Elzey, & Lewis, 1969). However, these scales also represent the "mixed bag" approach in that they consist of a mixture of competencies (e.g., communication skills, peer interactions, linguistic skills, cognitive skills) which have distinctive features at various developmental levels. For the purpose of such general developmental assessment, scales developed by Bayley (1969) or Uzgiris and Hunt (1975) are probably more valid and reliable instruments.

The major limitation of these gross measures of social competence is that the concept is lacking a clear or agreed-upon definition (Anderson & Messick, 1974) relevant to both handicapped and nonhandicapped populations. According to Routh and Mesibov (1979), social competence refers to those attributes of an individual which are desirable to both the individual himself/herself and to others. Edmonson (1974) has proposed a behavioral concept of competence which views competence as involving activities or behaviors on the part of the individual, e.g., responsibility, self-direction, as well as an understanding of others. On the other hand, O'Malley (1977) defines social competence in children in terms of social interaction between a child and his/her peers or between a child and adults. O'Malley describes socially competent interactions as either productive or satisfying, where productive interactions are those which help the child adapt to a setting, and satisfying interactions are those that are received positively by others.

In an attempt to determine which factors account for varying degrees of social competence shown during social interactions, some investigators have examined correlates of social competence. In a recent review, Simeonsson (1978) identifies the following correlates of social competence: socializing agents, social settings, personality variables, and ability level. Newman and Doby (1973) included the variables of social interaction, teacher expectation, home environment, age, sex, race, intelligence, and the number of years in school in a multivariate analysis of social competence. A major finding of this analysis was that positive social interaction accounted for approximately 25% of the variance on social competence, suggesting that skills in this area were associated with higher performance and adaptability of trainable mentally retarded children.

Clarification of the concept of social competence may also improve the assessment and training of adaptive skills in retarded individuals. For example, in a follow-up study of deinstitutionalized retarded persons in the community, Edgerton and Bercovici (1976) found that competence was one criteria that could be used for judging successful social adaptation.

In addition to potential usefulness as an outcome measure in deinstitutionalization studies, social competence has been proposed as an assessment measure for early intervention programs. Recently, investigators have identified specific

components for assessing social competence in young children as a means of evaluating educational and intervention programs such as Head Start. As opposed to the general "mixed bag" approach to social competence, Anderson and Messick (1974) have presented a "shopping list" of 29 social competence components. Their list is the product of a 1973 Office of Child Development Panel which met to define the meaning and measurement of social competence in young children, and to propose the development of social competence as a goal for early intervention programs. The complex and comprehensive nature of social competence becomes evident when one reviews the 29 components. Included are basic skills in memory, critical thinking, perception, language, gross and fine motor areas, problem solving and creative thinking, as well as role perception, sensitivity and understanding in social relationships, curiosity, morality, etc. Clearly, this "shopping list" appears too long and diverse to be practical for wide-scale program use.

Zigler and Trickett (1978) have more recently articulated the significance and content of social competence. Zigler and Trickett's index includes: (1) a measure of physical health and well being; (2) a measure of achievement; (3) a measure of formal cognitive ability; and (4) a measure of motivational and emotional variables. This index seems similar to a definition of social competence proposed by the Administration for Children, Youth, and Families (ACYF) which has defined social competence as:

> . . . the child's everyday effectiveness in dealing with his environment and later responsibilities in school and life. [It] takes into account the interrelatedness of cognitive and intellectual development, physical and mental health, nutritional needs, and other factors that enable a child to function optimally. (From Lee, Note 1, p. 1)

Using a different type of instrument, Lee (Note 1) has proposed an observational measure of "communicative competence" which seems harmonious with ACYF's definition of social competence. Lee operationally defines communicative competence as:

> . . . a behavioral manifestation of the ability to use linguistic, cognitive, and social skills effectively in conveying and responding to a message in interpersonal contexts to achieve goals desired by self and/or others. (p. 2)

Lee's definition incorporates nonverbal, or behavioral, social communication skills; thus, it appears to be appropriate for studying children who vary widely in age range and ability.

The conceptualizations of social competence offered by Anderson and Messick (1974), Zigler and Trickett (1978) and Lee (Note 1) were developed in response to a growing demand for methods to assess young children's social competence for evaluation and policy purposes. Two factors have limited the practical utility of these conceptualizations. First, although many investigators agree on the relative importance of social competence for the successful adaptation of retarded children, they tend to disagree on the actual components of social competence. Because of its

multidimensional nature, successive refinements of the concept of social competence may be a necessary prelude to valid assessment and training of socially competent behavior (Simeonsson, 1978). Secondly, these models or descriptions of social competence lack theoretical frameworks in which to consider the developmental nature of social competence in young children.

Although not equivalent to the area of social competence, there are two topics in the recent literature, social intelligence and social cognition, which overcome some of the above limitations. The topic of social intelligence is useful to explore because it describes the multidimensional nature of social competence by identifying its key research components. The topic of social cognition, based on cognitive-developmental theory, provides a useful research framework which emphasizes both cognitive and social domains.

Social Intelligence/Social Cognition

Greenspan (1979) has recently proposed a model of social intelligence which provides a framework for studying the broader areas of adaptive behavior and social competence in the retarded. The actual term, "social intelligence," appeared in the literature as early as 1920 as part of Thorndike's (1920) tripartite model of intelligence. Social intelligence was later the topic of a review by Walker and Foley (1973). According to Greenspan's (1979) proposed model, social intelligence refers to one's ability to

understand and deal effectively with social and interpersonal objects and events.

Greenspan's model contains a number of specific variables which can be operationalized and potentially used for assessing social intelligence. These variables include role-taking (in perceptual, affective, and cognitive realms), social inference, social comprehension, psychological insight, moral judgment, referential communication, and social problem-solving. In order to assess these social intelligence components in young children, a battery of measures drawn from the relevant social cognitive and psychological literature has been compiled (Chan, Greenspan, & Blacher-Dixon, Note 2). (Appendix A contains a summary of these measures.)

It should be noted that several of the social intelligence components (e.g., psychological insight, social comprehension, social problem solving) involve complex cognitive processes. For example, psychological insight is defined as the ability to understand individual differences and why people behave the way they do (Greenspan, 1979). The complexity implied in such definitions clearly restricts the applicability of this component to verbal children. In practical terms only a portion of Greenspan's social intelligence model appears to be applicable for research with very young children.

In summary, Greenspan's model is a taxonomy proposed to classify components of psychological processes into

categories useful for studying social behavior. As a theoretical model, it requires data to validate the proposed relationships among its components. Several of the individual components (role-taking, referential communication, moral judgment) of the model have, however, been researched under the rubric of social cognition.

Social Cognition. Shantz (1975) has defined social cognition as the child's intuitive or logical representation of others, and how he or she makes inferences about their inner psychological experiences. Defined in this manner social cognition provides a framework for investigating the developmental nature of social competence in young children. The term social cognition generally encompasses research based on the cognitive-developmental approach of Piaget, and has been reviewed extensively by Shantz (1975) and Youniss (1975).

During the past decade research in the area of social cognition has flourished, addressing questions concerning the child's understanding of others under such topics as role-taking, referential communication, empathy, moral judgment, or person perception. Table 1 summarizes the questions appropriate for each of the social cognitive research domains.

The appeal of social cognition as a domain of research is that it incorporates a developmental approach to the study of social competence which is appropriate for studies

Table 1

Research Questions Associated with Social Cognition

Research Domain	Research Question
Role-Taking:	
Perceptual	What is the other person seeing?
Affective	What is the other person feeling?
Cognitive	What is the other person thinking?
Referential Communications:	
Listener	What is the other person saying?
Speaker	What are the listening needs of the other person?
Moral Judgment	What is the other person intending?
Person Perception	What is the other person like?

across the life-span (Chandler, 1976). For example, it has been shown that growth in social cognition (i.e., one's interpersonal cognitive system) during adolescence is characterized by the organization and integration of psychological constructs formed during early childhood (Barenboim, 1977). Such a stage-based view of social cognition highlights the utility of this approach for studies in early childhood and on into adolescence.

Much of the research on social cognition has focused on extending Piaget's early work on role-taking development in which attempts have been made to validate or dispute Piaget's observations of childhood "egocentricism" (Piaget, 1926, 1932). Other social cognitive research has focused on dimensions of empathy, moral judgment, or referential communication which involve some sort of social understanding or ability to make inferences about others. For example, making inferences about one's feelings involves "empathy," making inferences about one's intents involves "moral judgment," making inferences about one's speech or choosing one's own communication on the basis of these inferences involves "referential communication." What complicates this inferential process is that the young child is frequently unable to take other people's representations into account when arriving at such inferences (Piaget, 1920). Hence, perspective-taking may be central to the development of the child's social cognitive orientations, although this issue has not been entirely resolved (Rubin, 1973).

There appears to be a link between role-taking, or taking the viewpoint of another person, and communicating about one's own point of view. Indeed, referential communication has been defined as "a person's ability to convey accurately to others what the person is perceiving, thinking, or feeling" (Greenspan, 1979, p. 38). The current study draws heavily on the two areas of role-taking and referential communication, both of which will be described in more detail in the following sections of the review.

Role-Taking

Much has been written on the development of role-taking and other social cognitive skills in nonhandicapped children (e.g., Flavell, Botkin, Fry, Wright, & Jarvis, 1968; Shantz, 1975), but the research pertaining to similar development in handicapped children is quite limited. This section will review (1) some of the definitions and developmental approaches to role-taking, (2) measures typically used to assess role-taking, and (3) empirical findings of role-taking skills in nonhandicapped children.

Definitions and Approaches

There are several definitions of role-taking which all reflect the interpersonal nature of the skill. Greenspan (1979) defines role-taking as the ability to put oneself in the shoes of others; to understand how others are

experiencing the world. Others have also suggested that role-taking involves putting oneself in the shoes of another person (Chandler, Helm, & Smith, Note 3), or viewing the world through another person's eyes (Kitano, Stiehl, & Cole, 1978). Kitano et al. (1978) designate role-taking as the covert cognitive process of predicting another person's perspective. Furthermore, they distinguish role-taking from role-playing--the overt enactment of the characteristics and behaviors of others. Socio-drama, too, is often confused with role-taking, although this term refers to a process whereby individuals participate in or witness their own reality through drama (Blumberg, 1976; Foster, 1975; Klepac, 1978; Robinson, 1970).

Some views of role-taking or social cognition have been oriented around issues of stage sequential development. For example, Piaget's (1970) theory has been used to study the emergence of social and psychological conceptions in children, and has been proposed as a useful model for the assessment and habilitation of mentally retarded individuals (Simeonsson, Grunewald, & Scheiner, 1976). Research on role-taking often involves the use of Piagetian methods or concepts for examining the child's understanding of his/her social, as opposed to nonsocial, world. Much of the current research on role-taking focuses on the construct of egocentrism, in order to validate or dispute Piaget's observations (Piaget, 1926, 1932). Findings from studies using social cognitive tasks with nonhandicapped

subjects have generally provided support for Piaget's proposed qualitative shifts in cognitive structures, essentially showing that the preoperational child (up to age five or six) is unable to decenter; that is, he/she fails to effectively consider two or more dimensions simultaneously in reasoning or judgment situations. This may be reflected in the failure to take into account the perspectives, thoughts, or feelings of another person in role-taking tasks, or inadequate recognition of the informational needs of the other in referential communication tasks.

According to Piaget, not until the age of seven or eight are sufficient role-taking skills acquired which allow children to engage in social, nonegocentric, communicative behavior. The link between egocentrism and role-taking thus appears to be a bidirectional causal relationship whereby peer interaction is a necessary factor in the development of role-taking skills, and vice versa. Piaget (1965, 1967) suggested that egocentrism decreases as a result of confrontation with peers whose wishes, perspectives, and thoughts are different from the child's. It is through these contacts that children are forced to recognize that other views and perspectives are possible, and thus learn to "take the role of the other."

In addition to Piaget's work in this area, several other investigators have also outlined models to represent the developmental, sequential nature of the emergence of role-taking skills in nonhandicapped children (Flavell,

1966, 1972, 1974; Flavell, Botkin, Fry, Wright, & Jarvis, 1975; Kurdek & Rodgon, 1975; Selman, Note 4; Urberg & Docherty, 1976). Flavell and his associates suggest a model of role-taking whereby role-taking activity serves as a means to some end, e.g., that of effectively communicating with another person (Flavell et al., 1975). They propose five components that need to develop in order for a child to role-take. These components are: existence, need, prediction, maintenance, and application. Existence refers to the child's knowledge that there is such a thing as a "perspective," i.e., that what the child may perceive, think, or feel in a given situation may be different from what another person perceives, thinks, or feels. Need implies that the child realizes that some analysis of the other person's perspective is necessary for achieving one's [role-taking] goal. The prediction component indicates that the child realizes how such an analysis might be carried out, i.e., what abilities are needed to accurately discriminate relevant role attributes. Maintenance refers to the way the child remains aware of the cognitions yielded by the above analysis, even when they are in competition with the child's own point of view. Application is how the child applies such cognitions and behaves appropriately, e.g., translating what one knows about the other's listener role attributes into an effective message. This five component model of Flavell's (1974) appears to represent an information-processing approach to role-taking.

Flavell (1974) has further proposed that role-taking can be assigned to four specific, developmental levels. Level 0 is characterized by the absence of symbolic representation of any visual act or experience. In other words, the child can anticipate objects or perspectives that he/she can see, but cannot as yet represent to him/herself any one else's perspective. At Level 1 the child still cannot represent other's perspectives, but he/she can determine what objects the other person may be seeing. At Level 2 the child can represent the fact that he/she and another person see different objects from different perspectives. Level 3 is a further elaboration of Level 2 involving the ability to represent another's perspective with such precision and clarity that both the child and the other can go on considering each other's point of view indefinitely. These levels appear to represent critical steps in the development of role-taking ability.

Flavell's approach to role-taking as described above is a structural developmental approach, i.e., he has proposed a sequence of developmental age-related structures that are displayed at different levels of social understanding. Flavell and his colleagues (Flavell, Botkin, Fry, Wright, & Jarvis, 1975) have also demonstrated the existence of these stages using various communication and social problem-solving tasks. Similarly, Feffer (1959, 1970; Feffer & Gourevitch, 1960) explored role-taking stages using projective story-telling tasks, as did Selman and

Byrne (1974), by focusing on role-taking within the context of moral dilemmas. Hence, role-taking structures have been identified in several interpersonal contexts.

In another exploration of the developmental aspects of role-taking, Kurdek and Rodgon (1975) examined types of role-taking in kindergarten through sixth-grade children. They utilized three kinds of perspective or role-taking tasks: perceptual (i.e., what is the "other" seeing?), cognitive (i.e., what is the "other" thinking?), and affective (i.e., what is the "other" feeling?). Intercorrelations between the tasks were low and consistent, suggesting that role-taking may be a multidimensional social-cognitive construct. Further evidence for the multidimensional nature of role-taking appears in a study by Urberg and Docherty (1976). These investigators presented five role-taking tasks to three-, four- and five-year-olds, which formed a hierarchy such that skills needed for earlier tasks were prerequisites for later ones. The data were analyzed by scalogram and cluster analyses which revealed that the tasks were highly scalable and formed distinct clusters related to the type of role-taking task. The major structural difference between tasks was the type of decentering involved--sequential versus simultaneous decentering. Similar to Flavell et al. (1975), Feffer (1970), and Selman and Byrne (1974), these investigators identified three sequential levels of role-taking skills.

A few investigators have taken approaches to social

cognition and/or role-taking different from those just reviewed. For example, Youniss (1975) sees such development as an interpersonal or social process in which cognitive development regulates the "self" while the child comes to know others. Both Chandler (1976) and Barenboim (1977) have attempted to explore aspects of social cognition in older individuals, e.g., adolescents or adults. These researchers present thought provoking analyses of role-taking and social cognitive development throughout the life-span. An extensive treatment of their work will not be detailed here because the present review is concerned mainly with research and theoretical formulations relevant to role-taking and communication in very young (chronically and developmentally speaking) children.

The following section outlines some of the experimental tasks used to assess role-taking in children up to five years of age. Most of the tasks explore the domain of perceptual role-taking which corresponds to the question "What is the other person seeing?" The literature to date seems to contain more measures of perceptual role-taking than measures of affective or cognitive role-taking in early childhood (Chan, Greenspan, & Blatner-Dixon, Note 2). Furthermore, perceptual role-taking has been more frequently studied in children as young as one, two and three years of age than other types of role-taking (Borke, 1975; Flavell, Shipstead, & Croft, 1978; Lempers, Flavell, & Flavell, 1977; Masangkay, McCluskey, McIntyre, Sims-Knight,

Vaughn, & Flavell, 1974; Strayer, Bigelow, & Ames, Note 5).

Assessment

Role-taking skills have been assessed in children during infancy, early childhood, later childhood, and adolescence. The complexity of the measures may increase with the age of the child by varying tasks along one or more dimensions. The tasks themselves may differ as to the type of inference required of the child. For example, is the child asked to describe another's visual perspective or psychological properties? The type of response required of the child may be verbal or nonverbal, and the task itself may be in some game format, story-telling format, or more standardized testing situation (Hudson, 1978).

Most of the perceptual role-taking tasks for preschoolers and young children are simplified variations of Piaget's and Inhelder's "three mountain" experiment (1956). In this study, a child was shown a three-dimensional landscape and photographs taken of the landscape from different viewpoints. The child was asked to select the photograph which identified the perspective assumed by a doll who was placed at various locations around the landscape. On the basis of their performance on this task, young children were found to be "egocentric" if they attributed their own perspective to the doll.

Since Piaget's original experiment was too complex for assessing role-taking in preschool children, a number of

simplified variations have been developed. A classic modification of Piaget and Inhelder's (1956) three-mountain task was utilized in a study by Borke (1975). Borke included several three-dimensional displays varying in complexity. Using three and four-year-olds, she found that the nature of the task complexity seemed to determine the ease with which children could discriminate cues for visualizing another's perspective. Using more complex toy displays and photographs, Salatas and Flavell (1976) also showed that children made more egocentric errors under complex task conditions.

The collection of role-taking tasks for three to five-year-olds available in the literature vary slightly, but all involve the presentation of a stimulus to the subject and one or two questions regarding the orientation of that stimulus. Masangkay et al. (1974) carried out an experiment with children three to five years old using tasks which varied from simple descriptions of pictures to viewing whole objects from different vantage points. In tasks of this type, the experimenter asked the subject questions about the various visual displays. The age-related trends in accomplishing tasks found by Masangkay et al. (1974) were consistent with similar work by Fishbein, Lewis, and Keiffer (1972).

Flavell and his colleagues investigated perceptual role-taking with 3-, 4-, 5- and 6-year olds using tasks such as a cardboard cube with different pictures on its sides

(Flavell, Botkin, Fry, Wright, & Jarvis, 1968). The tasks and their scoring procedures are fully described in Flavell, Botkin, Fry, Wright, & Jarvis (1968). As a basic scoring technique, these authors developed a range of possible answers children might give, and then indicated the number of subjects at each age who responded at each level. These response categories, and the tasks themselves, can thus be used by other investigators. For example, Wilson and Shantz (1977) adapted several of Flavell et al.'s (1968) tasks in a study which attempted to relate dependency in early childhood with role-taking skills. The Wilson and Shantz study utilized a binary scoring procedure, where a response which reflected egocentrism was scored "0", and a response which demonstrated any type of role-taking ability was scored "1". Similar tasks and procedures were adopted by Zahn-Waxler, Radke-Yarrow, and Brady-Smith (1977) in their study relating perspective-taking to prosocial behavior.

A unique perceptual role-taking task developed by Liben (1978) has also been used with children as young as three years of age. The "glasses task" involved the use of a pair of child's sunglasses with yellow lenses, a pair of adult sunglasses with green lenses, and a white unlined index card. The experimenter asked the child, "What color does this card look like to you? What do you think this card looks like to me?" Conditions included glasses worn by child only, by experimenter only, by both child and

experimenter, and by neither child nor experimenter. Although young children were aware that they and others could see things differently, they did not show this awareness on more complex spatial tasks.

Chandler, Helm, and Smith (Note 3) and Blacher-Dixon and Simeonsson (1978) utilized a perceptual role-taking task, the "Droodles," which was adapted from a set of commercial cartoons. The task consists of a set of cards which have a complete black and white drawing on one side, and a limited or partial view on the other side. After the child is asked to identify the complete view, he or she is asked to describe what the key hole view would look like to a friend who did not have access to the complete picture. The idea behind this task is that only the nonegocentric, or decentered, child would be able to assume the limited perspective of the "other" person.

Perceptual role-taking seems to be the earliest and most easily measured social cognitive skill in children as young as 18 to 24 months, and there are several measures appropriate for this age group. In the first part of a study by Masangkay, McCluskey, McIntyre, Sims-Knight, Vaughn, & Flavell (1974), two- and three-year-olds were administered a "picture task" and an "eye position task." The picture task contained six subtasks consisting of cards or pieces of Plexiglas with pictures of objects pasted onto both sides of them. The task variables were size of stimulus and construction materials. The sets of stimulus pictures

included objects such as a cat, dog, apple, or duck. The child would be shown a stimulus material and asked to name the picture on each side. The experimenter would then hold the stimulus card vertically and ask, "What do you see? What do I see?" The eye position task involved placing four toys around the child, pointing to each object and asking the child to name it. The experimenter then looks at each toy with his/her eyes only and repeats the question.

Masangkay et al. allowed some leeway on scoring for these tasks, i.e., less verbal children could point to the appropriate object on the eye position task. This study presented some evidence that using these simple measures, even two-year-olds could express some rudimentary knowledge about other people's visual acts and percepts. Strayer, Bigelow, and Ames (Note 5) found similar results. They administered a modified version of the picture task to children at the ages of 19, 22, 25, 28, and 31 months.

As a result of the two studies cited above, Lempers, Flavell, and Flavell (1977) developed 23 perceptual role-taking tasks for use with children between one and three years of age. Three types of tasks were included: (1) Percept production, i.e., requiring the child to produce a visual percept in the other, primarily by showing objects; (2) Percept deprivation, i.e., involving the child in a variety of object-hiding tasks; and (3) Percept diagnosis, i.e., asking the child to determine what the other is looking at or attending to. These tasks are

similar to, but less complicated than, those used by Masangkay et al. (1974).

Using measures of the type described in this section, researchers have gathered data to support many of the theoretical views of role-taking. The following pages present findings from developmental and comparative studies of role-taking in children.

Major Findings: Developmental and Comparative

Findings from studies in role-taking situations support a stage-like development of role-taking skills (Flavell, 1974; Selman & Byrne, 1974; Urberg & Docherty, 1976), with chronological age (CA) proposed as a critical factor in predicting role-taking performance (DeVries, 1970). Studies using nonhandicapped subjects have generally been in support of Piaget's proposed qualitative shift in cognitive structures, essentially showing that the pre-operational child (up to age five or six) is unable to decenter between conflicting cues, roles, and/or perspectives. These findings may at least in part be based on specific tasks and/or theoretical formulations adopted to define role-taking. Research studies utilizing simpler tasks and/or operational definitions have revealed that even very young preschoolers are able to assume spatial perspectives of another person (Borke, 1975; Flavell, Shipstead, & Croft, 1978) and are characterized by some aspects of affective role-taking or

altruism (Borke, 1971, 1972; Hoffman, 1975). Thus, rather than trying to resolve the debate in the literature (Borke, 1972, 1975; Chandler & Greenspan, 1972) as to the age when role-taking ability specifically emerges, it seems more productive to consider the constituent components of social cognition or awareness. In this context, precursors of social cognition (e.g., simple role-taking and referential communication) have been noted in preschoolers (Mossler, Marvin, & Greenberg, 1976; Wellman & Lempers, 1977) and evidence of perceptually-based knowledge of other's visual/attentional acts and abilities (demonstrated by skills such as showing or hiding) has been shown in the very young child from ages one through three (Lempers, Flavell, & Flavell, 1977).

There are few studies of role-taking in handicapped populations, and those that exist vary widely in the subjects and tasks used. Therefore, a direct comparison of findings from research with handicapped and nonhandicapped children is not possible. However, the identification of a developmental sequence of role-taking in nonhandicapped children provides a type of "norm" against which to view results of tests with handicapped populations. Studies of emotionally disturbed children (Neale, 1970; Simeonsson, 1973; Chandler, Greenspan and Barenboim, 1974) have shown that both the maturational trend of socialization and the reduction of egocentrism were less evident in disturbed than in nondisturbed children. Orthopedically handicapped children have

also been found to perform more poorly on role-taking tasks than nonhandicapped chilren (Volpe, 1976). In addition, low levels of role-taking ability have been found in retarded populations by Affleck (1975 a, b; 1976). Simeonsson and Foye (Note 6) found that a role-taking deficit in retarded subjects was obtained even when compared to nonretarded subjects of similar MA. In general, studies have indicated that handicapped children are delayed in social-cognitive development and that they are characterized by greater egocentrism on role-taking tasks than their peers.

Role-taking, as well as communication effectiveness, appear to be critical components of interpersonal competence in handicapped populations, just as they are in nonhandicapped populations (Weinstein, 1975). For example, Affleck (1976) has shown that role-taking ability is a determinant of interpersonal tactics in that individuals who performed well on taking the role of others used better strategies for solving an interpersonal task.

Role-taking may also be related to communicative effectiveness in children. In a series of studies, Longhurst (1974) demonstrated that the retarded child's ability to communicate is not simply a function of vocabulary or IQ, but of perspective taking ability as well. Employing a speaker-listener paradigm for a referential communication task, Longhurst (1972) found that mentally retarded adolescents could follow their own instructions, but were inadequate in their communication to others. The retarded

adolescents thus demonstrated their failure to take into account the listener's needs, despite the fact that they had demonstrated the possession of appropriate verbal skills.

Based on these research findings, it can be concluded that: (a) social cognitive skills in retarded individuals are not determined solely by intelligence levels; and (b) role-taking and communication, as component skills of social cognition, are related to socially competent behavior in retarded or handicapped persons.

Referential Communication

Definitions and Approaches

In Shantz's (1975) comprehensive review, referential communication was cited as a component of social cognition. Research in this domain often corresponds to the question, "What is the other person saying?", but it may involve the study of both speaker and listener skills. For example, Rosenberg (1972) defines referential communication as the way in which a speaker selects from his repertoire of names, descriptions, and gestures in order to communicate with his listener about certain objects, events, or relationships. It also involves the way in which a listener correctly or incorrectly identifies the speaker's referent from the speaker's utterance. Greenspan, Burka, Zlotlow, and Barenboim (1975) have described referential communication

more simply as the process by which one attempts to provide sufficient descriptive information regarding a particular object or action on an object such that a second person has a clear idea of what the first person has in mind.

Piaget's (1970) theory is also appropriate for conceptualizing development in the area of referential communication. According to Piaget, not until the age of seven or eight are role-taking skills sufficiently developed to allow children to engage in nonegocentric, social communicative behavior.

With reference to communication skills, a communicatively egocentric child is one whose speech is not accomodated to the needs of the listener, and a communicatively nonegocentric child is one whose speech accommodates the listener and/or is adjusted in response to listener feedback. Hence, egocentric speech may be due to the child's inability to predict the perspective of others and to tailor his/her speech to fit that perspective.

The speech of young children has often been characterized as "egocentric" or "private" (Kohlberg, Yeager, & Hjertholm, 1968; Piaget, 1926; Vygotsky, 1962). However, recent research suggests that young children do possess forms of socialized communication. An examination of unique task variables may account for some of the discrepancy found in different studies on the communicative abilities of young children. The next section briefly reviews relevant referential communication tasks or measures appropriate for

young children, and is followed by empirical findings in this area.

Assessment

Most referential communication studies have adopted some variation of a "listener-speaker" paradigm, a two person communication situation used to study the flow of behavior between a speaker and a listener. Krauss and his associates (Glucksberg & Krauss, 1967; Glucksberg, Krauss, & Higgins, 1975; Krauss & Glucksberg, 1977; Krauss & Glucksberg, 1969; Krauss & Weinheimer, 1964) have popularized this technique. In their classic experimental task the speaker and listener are separated by a barrier or screen. The speaker is asked to describe novel forms of six blocks (stacked onto a dowel) to the listener on the other side of the screen. The listener, who has an identical array of blocks before him/her, is to choose the correct blocks in order to match the speaker's stack. Different versions of this task have been used with subjects ranging in age from preschoolers to adults.

Of particular relevance to this study are those referential communication measures appropriate for chronologically and developmentally young children. Studies by Maratsos (1973) and Meissner and Apthorp (1976) have utilized a referential communication task appropriate for three to five year olds. Both studies required the child to communicate to adults who were either blindfolded or not blindfolded. The

two experiments differed on the actual task used (playing a game vs. playing "store") and on experimenter characteristics (male vs. female or black vs. white).

The Communicating All Necessary Steps (CANS) task (Monson, Greenspan, & Simeonsson, 1979) has been used with kindergarten children (Monson, 1978) and could be easily adapted for use with preschoolers. This task is a modified version of the task developed by Krauss and his colleagues. The CANS utilizes the following set of stimuli: (a) four large cans--two red and two blue; (b) four small cans--two red and two blue; and (c) five objects--paper clip, eraser, pencil, penny, whistle. One can of each description is placed in a row of four on top of a table and similarly beneath a table. After pointing out the arrangement of cans to the child, the experimenter explains that both of them will leave the room (or go behind a divider) and that the child alone should return with one of the objects, place it under a can, and return to the experimenter. The subject is then asked to report exactly where the object was placed, and then the experimenter retrieves the object, providing feedback to the child. The entire procedure is repeated for all five objects. The child's descriptions are scored according to accuracy, which includes the dimensions of location (on or under the table), size, and color of the can.

The perspective taking tasks of Lempers, Flavell, and Flavell (1977), described in the previous section on role-

taking, also assess rudimentary communication skills in children. In many of the tasks included in Lempers et al., the child is required to demonstrate knowledge of another person's perspective and to communicate that knowledge to the other person in either a verbal or nonverbal manner.

Major Findings: Developmental and Comparative

Many of the results from studies on referential communication in nonhandicapped children confirm Piaget's (1926) notions about the development of communication. In general, young children's communicative efforts tend to be egocentric and lacking in accuracy (Alvey, 1968; Asher, 1976; Asher & Oden, 1976; Karabenick & Miller, 1977; Krauss & Glucksberg, 1969). Results suggest that the competent listener must have the same skills as the competent speaker (Ironsmith & Whithurst, 1978), but listener proficiency may develop earlier than speaker proficiency (Krauss & Glucksberg, 1969). Both skills, however, seem to increase with age.

Several variables may affect the performance of children on referential communication tasks. Such factors include memory (Asher & Oden, 1976), ability to decode messages (Bearison & Levey, 1977), perceptual discrimination ability (Susswein & Smith, 1975), the development of plans on the part of the listener (Cosgrove & Patterson, 1977; Patterson, Massad, & Cosgrove, 1978), and perspective or role-taking ability (Garmiza & Anisfeld, 1976; Keyes, Hoemann, & Rogers, Note 7); Robinson & Robinson, 1976). Even

family background may affect communication performance. According to Bearison and Cassel (1975), children from predominantly person-oriented families showed greater evidence of accommodating their communication to the listener's perspective than children from position-oriented families. The investigators characterize person-oriented families as having the relationships among family members based upon individual psychological properties, e.g., needs, intents, or motives. Position-oriented families have relationships based on positions of members, e.g., sex, age, or status.

A number of other investigators claim that egocentrism, or centration, is only one factor which may account for the generally poor communicative performance of young children. Furthermore, the notion of egocentrism may be insufficient to explain the variation in children's communication task performance. Shatz (1977), for example, suggests that researchers have underestimated the ability of preschoolers, whose communicative competencies may be masked or unused in specific experimental situations.

Shatz is by no means the sole supporter of the idea that young children are communicatively competent. Hoy (1975) claims that many measures based on the speaker's communication alone, without regard to listener attributes or situational parameters, may lead to spurious estimates of the egocentric content of children's communication. Studies by both Maratsos (1973) and Meissner and Apthorp (1976) have shown that preschoolers are able to take a blindfolder listener's condition into account in a

communication task. Findings from both studies showed that preschoolers were sensitive to the unusual visual needs of the listener, as indicated by their appropriate verbal messages. Rodgon, Hurtig, & Kurdek (Note 8) also claim that preschoolers are aware of the need to respond to a listener's dilemma, even if they are not sure or capable of doing so.

Research with young children has shown that basic communicative tasks can be assessed with children as young as one to three years of age. According to Wellman and Lempers (1977) this type of social communication includes three things: (1) the ability to engage others in some kind of interaction; (2) the ability to take the role of another by accommodating one's messages to listener needs; and (3) the ability to reformulate one's message in response to listener feedback. This concept of socialized communication seems to require social and cognitive skills beyond those of a preschooler, yet investigators such as Lempers, Flavell, and Flavell (1977) have shown that 2-year-olds were perfectly capable in this regard when appropriate tasks were used. These investigators explored early social-cognitive development by assessing the young child's behaviorally expressed knowledge of people's visual-attentional acts and abilities. Their 60 subjects ranged in age from 11-1/2 to 37-1/2 months. Three types of tasks were used, none of which required a verbal answer from the child, but which did require some receptive language skills. The

tasks assessed children's social understanding in the following areas: (a) percept production (e.g., showing), in which the child was asked to produce a visual percept for another person; (b) percept deprivation (e.g., hiding), in which the child was asked to partake in a number of hiding tasks; and (c) percept diagnosis (e.g., pointing), in which the child was asked to determine what another person was visually attending to.

The findings of this study suggested that very young children do have a rich repertoire of communication skills. Although one-year-olds could produce and comprehend pointing, and perhaps show a toy in a rudimentary way, they did little else. Three-year-olds, on the other hand, were nearly at ceiling on most of the tasks. The tasks appeared to be age-related, such that older children were more likely to do them correctly. Hiding ability clearly emerged later than showing ability. On the basis of Guttman scaling analyses, there was evidence that the tasks formed an ordinal sequence. The authors claimed that the age trends in the data reflect important developments in the area of social interaction, communication, and perceptual role-taking. Specifically, they asserted that the skills of pointing and showing, for example, were "acts of social communication and instruments of social interaction" (p. 40).

The above findings were not restricted to laboratory or experimental settings, but also observed in naturalistic settings. In observational studies, preschool children have

demonstrated their ability to produce social speech and to adapt their speech to the needs of the listener (Garvey & Hogan, 1973; Shatz & Gelman, 1973; Spilton & Lee, 1977).

Unlike research with nonhandicapped populations, however, communication studies with retarded subjects tend to involve primarily school-age children or adolescents. Such studies have generally adopted the model used with nonhandicapped subjects--a two-person communication situation used to study the flow of behavior between a speaker and a listener. However, when this paradigm is used to assess the deficiencies of retarded children in describing objects, events, or relationships to listeners, a number of assumptions are made, as pointed out by Longhurst (1972). For example, the child needs to have a number of speech and language skills in order to be successful at producing descriptions. The child's speech must be intelligible, and his/her vocabulary must be large enough to differentiate between attributes of the referent (i.e., the thing to be described) and any non-referents. Finally, the child must be able to discriminate among objects in an array, people, or other items involved in the task. Due to the verbal nature of most interpersonal communication tasks used with the retarded, older children have usually been included as subjects in these studies (e.g., Hoy & McKnight, 1977; Longhurst & Berry, 1975; Longhurst, 1974).

Results of communication studies with retarded adolescents have shown that they generally have communication skill

deficits. In one study by Longhurst (1974), which utilized the classic listener-speaker paradigm, retarded adolescents in the speaker role generated rather egocentric descriptions which had meaning to themselves, but little meaning for their listeners. In another, but similar, study, Longhurst and Berry (1975) divided retarded adolescents into three levels on the basis of their intelligence and adaptive behavior. Again, the subjects' task was to describe figures for a confederate adult listener so that the listener could select similar stimuli from an array. After speakers received feedback in response to their communication failures, they were given a chance to provide a second description. Significant differences in number and types of redescriptions were found among subjects of different intelligence levels.

In studies of communication style using retarded children it has been shown that both high level communicators and low level communicators can alter their style of communication to low level listeners (Hoy & McKnight, 1977). However, even these communication adjustments were ineffective in producing greater listener understanding. The authors suggest that communication skill training for retarded children must be concentrated on both the linguistic form and the appropriateness of the message.

In summary, referential communication research with retarded or handicapped subjects indicates that older children or adolescents are generally poor communicators on tasks involving either listener or speaker skills. Communication

studies with young handicapped or retarded children have not, to date, been published and point to an important area for research.

Problems and Rationale

Although the development of role-taking and communication skills in children has been widely researched in non-handicapped children, there are several unresolved basic issues in extending these findings to handicapped children. For example, there is an ongoing debate in the literature as to the specific age and/or characteristics of the decline of childhood egocentrism. Many research findings have indicated that young children are unable to take another person's perspective into account. Presumably, the ability to communicate follows a developmental trend similar to that associated with role-taking, i.e., children do not demonstrate mature communication skills until the age of at least seven or eight years. The dispute as to the exact age that certain social cognitive skills appear (Borke, 1971, 1972, 1975; Chandler & Greenspan, 1972), however, may be due at least in part to discrepancies in the type of social cognitive measures used.

In the area of communication, for example, one can see that the more conceptually difficult a task is for a child, the poorer his/her communicative ability will appear (Krauss & Glucksberg, 1977). When communication tasks require children to verbalize descriptions of meaningless designs or geometric patterns (Krauss & Glucksberg, 1969; Longhurst,

1974; Longhurst & Berry, 1975; Peterson, Danner, & Flavell, 1972), both young nonretarded children and retarded children and adolescents do quite poorly. On the other hand, when children are required to give behavioral or gestural evidence of their communication skills, findings suggest that children as young as two or three years of age are competent communicators. Blank (1974) has suggested that three-year-olds may prefer to communicate via gestures if they are not compelled to used language.

Communication deficits clearly characterize the social interaction behaviors of many retarded children and adults. In studying communication skills of the retarded, researchers have focused on tasks which directly or indirectly tap their linguistic abilities, rather than focusing on other nonverbal variables which may also reflect their communicative ability. Schiefelbusch (1969) claimed that communication is an interpersonal process which involves both verbal and gestural behavior between two or more people. The varied uses of such nonverbal communication have been suggested by Argyle (1972). For example, nonverbal signals may be used to manage one's immediate social situation (e.g., to convey one's emotional state), they may support other verbal communication (e.g., facial expressions or hand movements), or they may replace verbal communication (e.g., sign language). Very little research on nonverbal or basic communication skills in retarded individuals has been reported. That which is described in the literature involves

primarily moderately to severely retarded, rather than mildly retarded groups. For example, Landesman-Dwyer, Stein, and Sackett (1976) have shown that severely and profoundly retarded individuals can communicate their basic needs through nonverbal means. Monson, Greenspan, and Simeonsson (1979) used referential communication tasks with moderately retarded children who had mental ages as low as four years, but the nature of the experimental task required a specific level of verbal competence. In their review of nonverbal elements of social behavior and successful community adaptation of the retarded, DeRisi and Aiello (Note 9) suggest that nonverbal communication deficiencies early in life might interfere with the development of both verbal and nonverbal communication skills. In light of the importance of this topic, it is indeed surprising that researchers have not examined the communication skills of retarded children using tasks which make limited linguistic demands. Based on Krauss and Glucksberg's (1977) approach in which a communication task appropriate for adults was successfully performed by children when tasks demands were greatly reduced, it should be possible to further reduce task demands to be appropriate for preverbal retarded children. It would be important, diagnostically and therapeutically, to determine if early communicative abilities are present in young retarded children, just as they are present in young nonretarded children. The methodology proposed by Lempers, Flavell, and Flavell (1977), which was described

earlier, has potential for exploring basic social-cognitive skill development in young retarded children. However, certain limitations inherent in the original procedure of Lempers et al. should be recognized. First of all, the children were tested in their own homes with their mothers present and, in many cases, serving as one of the two experimenters. All children were white and from middle class families; in most cases both parents had college education. The generally high socioeconomic status of the parents, coupled with the fact that each child's own mother was present during testing, might have contributed to a spuriously high child performance. It has indeed been suggested that the presence of the child's own mother in standardized testing situations (e.g., during administration of the Bayley scales or the Stanford-Binet) may promote higher test behavior on the part of the child than a situation in which no mother is present or in which an unknown female adult is present (Haskins, Ramey, Stedman, Blacher-Dixon, & Pierce, 1978).

In summary, the following problems are germane to this study:

(a) There has been little or no effort made to determine what social cognitive skills, if any, developmentally young retarded children have.

(b) There is an available methodology for exploring the above-mentioned skills which places few linguistic demands on the children by requiring

nonverbal indicators of social awareness, such as showing, hiding, or pointing (Lempers et al., 1977). However, that methodology is confounded by socioeconomic factors and procedural problems.

(c) Although there is evidence that young nonhandicapped children demonstrate early social cognitive skills in a developmental, ordinal sequence, similar work with retarded or handicapped children has not been carried out.

In keeping with the problems and issues identified in this review, the purpose of the following study was to systematically investigate social cognitive development in young retarded children by analyzing their role-taking and fundamental nonverbal communication skills. A secondary purpose was to confirm and elaborate the findings of Lempers, Flavell, and Flavell (1977). To achieve these purposes, the approach of Lempers et al. was adopted as a strategy for assessing communication behaviors in developmentally young retarded children.

The major questions addressed in this descriptive study are as follows:

1. What are the fundamental social-cognitive skills of developmentally young retarded children? To answer this question, the earliest demonstration of social cognitive development in young retarded children will be documented using a set of experimental tasks.

2. What are the characteristics and developmental features of such skills? The emergence of these social-cognitive skills will be systematically analyzed using descriptive statistics and scalogram techniques.

3. Are previous findings on the development of fundamental communication skills in nonretarded children replicable in a broader socioeconomic sample? An attempt will be made to confirm the Lempers et al. findings using a local sample of nonretarded children. Similar analyses to those carried out on the data from retarded subjects will be performed. Data from the nonretarded subjects will be used to extend the findings of Lempers et al. and to determine whether their results are replicable and reliable with nonretarded preschoolers.

CHAPTER II

METHOD

Subjects

The subjects for this study were 39 mentally retarded children and 61 nonretarded children.

Retarded Children

All of the retarded children participating in this study were enrolled in one of two local developmental day care centers, the Happy Time School in Burlington and the Sara Barker Development Center in Durham, North Carolina. The children ranged in chronological age from 24 months to 92 months ($\bar{x}$ = 55.6). Mental ages, available from records for 31 of the children, ranged from 7 months to 45 months ($\bar{x}$ = 28.6).

In order to insure that specific sensory or physical disabilities of the retarded children would not be a confounding factor in the study, a skills checklist (see Appendix B) for determining subject eligibility was filled out for each child by teachers. This was done after permission forms were obtained, but prior to any child's inclusion in the study. This instrument is a checklist used to determine whether children had the physical abilities

required for participation, e.g., adequate vision and hearing, ability to grasp objects in some rudimentary way, etc. The items on this list were selected from the Learning Accomplishment Profile (Sanford, 1974). Of the 50 retarded children who were potential subjects for this study, nine were eliminated on the basis of their low skills checklist score. The appropriateness of using the skills checklist as an index of basic competence to determine the eligibility of subjects for this study was demonstrated by the fact that significant correlations of .67, .78, and .59 were found between the checklist and the mental age, social age, and social quotient of the subjects, respectively.

In summary, the following criteria were used for the inclusion of retarded children in this study:

1. A minimum of five selected items on the sensory/physical skills checklist.
2. Evidence for an organic etiology of retardation based on either clinical judgment of staff members and/or records on file.
3. Chronological age between two and seven years.

Table 2 contains a summary of demographic characteristics of the retarded children who participated in this study. Test scores and etiologies of retardation for individual subjects, where available, are contained in Appendix C.

Nonretarded Children

A sample of nonretarded children was included in this study for two purposes: (1) to replicate the findings of

Table 2

Demographic Summary for Retarded Subjects
(N = 39)

Child Characteristics	N	M	SD	Range
Sex				
Female	15			
Male	24			
Race				
White	22			
Black (non-white)	17			
Chronological Age (CA)[a]		55.65	15.44	24.0-92.0
Mental Age (MA)[a,b]		28.58	10.30	7.0-45.0
Level of Retardation[c]				
Mild (55-69)	12			
Moderate (40-54)	11			
Severe/Profound (≤39)	9			
Not specifically stated	7			

[a]Numbers given represent months.

[b]Mental ages were given or derived for 31 of the retarded subjects.

[c]These were derived from available test data and represent the 1973 AAMD classification levels; if no test scores were given, the information on etiology/diagnosis was used.

Lempers, Flavell, and Flavell (1977) using a local sample of children without a socioeconomic bias, and (2) to obtain a normative framework from which to view the performance of the retarded subjects.

Like the retarded subjects, all nonretarded children participating in this study attended preschool or a day care center on a full-time basis. The 61 nonretarded subjects were drawn from two Chapel Hill and one Durham, North Carolina, settings. The three centers combined children from both black and white families of various educational levels and of high, medium, and low socioeconomic status. The income of parents, at each school, ranged from under $5,000 to over $15,000.

Children between the ages of 1 year 6 months and 4 years 6 months, whose parents signed the consent forms, could participate. Nonretarded children at each of the approximate ages of 2, 3, and 4 were included. Table 3 contains a summary of demographic characteristics of the nonretarded children.

Subject Variables

In addition to the use of the Skills Checklist described earlier, information on several classification variables was obtained for all subjects.

Vineland Social Maturity Scale

The Vineland Social Maturity Scale (VSMS) was selected

Table 3

Demographic Summary for Nonretarded Subjects
(N = 61)

Child Characteristics	N	M	SD	Range
Sex				
Female	35			
Male	26			
Race				
White	32			
Black (non-white)	29			
Chronological Age (CA)[a]		37.72	10.16	18.0-54.0

[a]Numbers given represent months.

as a measure of social competence which could be collected for all subjects in this study. Even though the limitations of this instrument have been delineated previously in this review, its selected use as an estimate of developmental status in this study was felt to be appropriate. The actual scale items, arranged in order of increasing average difficulty, represent progressive maturation in the domains of self-help, self-direction, location, occupation, communication and social relations. One of the underlying assumptions of the scale is that maturation in social independence may be taken as a measure of progressive development in social competence. For each subject, the scale yields a Social Age (SA) score and a Social Quotient (SQ). For descriptive purposes, the SA may be considered statistically and methodologically comparable to Binet mental ages (MA's) and the SQ to Binet IQ's. (Additional information on the Vineland Social Social Maturity Scale and a sample test protocol are presented in Appendix K.)

Social Maturity Rank

This instrument, developed specifically for this study, relies on teacher estimation of how socially mature a child is, relative to all other members in the child's classroom. For each subject, the Social Maturity Rank is expressed as a percentile, which is derived by dividing the rating assigned to a child by the total number of children in the class. Although the instrument cannot be used to compare social maturity rankings for children from different classrooms, it

does provide a general index of social maturity within groups of retarded and nonretarded children in this study. A sample Social Maturity Rank protocol, with directions for scoring, is presented in Appendix D.

Child Characteristics

A few days before children were tested, teachers were requested to complete the skills checklist for all children whose parents gave permission for them to participate. Teachers of the retarded children were also asked to indicate which children (a) required special reinforcers, (b) required unusual teaching strategies, or (c) had bizarre or destructive behaviors. The experimenter also obtained relevant testing, IQ, and diagnostic information for each subject during this time.

Materials

Communication Tasks

The communication tasks used in this study were based on those developed by Lempers, Flavell, and Flavell (1977). Their materials consisted of 23 nonverbal tasks involving, in their terminology, "percept production," "percept deprivation," and "percept diagnosis." In percept production tasks the child was to produce a visual percept for another person, i.e., showing. For example, the child would be asked to show objects varying in dimension or form to a person with varying "perceptual needs." In percept deprivation tasks the child was to remove a visual percept from

another person, i.e., hiding. These tasks examine things such as the child's knowledge of hiding objects or the child's ability to hide himself or herself. In percept diagnosis the child was to determine what the other person was already visually attending to, either by looking to where the other's finger was pointed or to where the other's eyes were directed. These tasks thus examine the child's ability to comprehend and respond to another's gestures.

A complete list of the Lempers et al. tasks is contained in Table 4. Pictures, blocks, toys and other common objects were used for all tasks with the exception of Tasks 9a, 9b, 11a, 15a, and 15b. For these, the simple toy apparatus depicted in Figure 1 was used. The construction and presentation of stimulus materials was accomplished according to direct instructions from Lempers, who served as a consultant to this project.

Procedure

Study Preparation

Prior to the collection of data a workshop was offered for teachers and staff at each of the developmental centers containing handicapped children. This consisted of an overview of the study and the potential significance of the findings, and also a specification of the responsibility of the school personnel.

Informed consent from each child's parent(s) or foster parent(s) was obtained through a detailed parent permission letter (see Appendix E for sample letters).

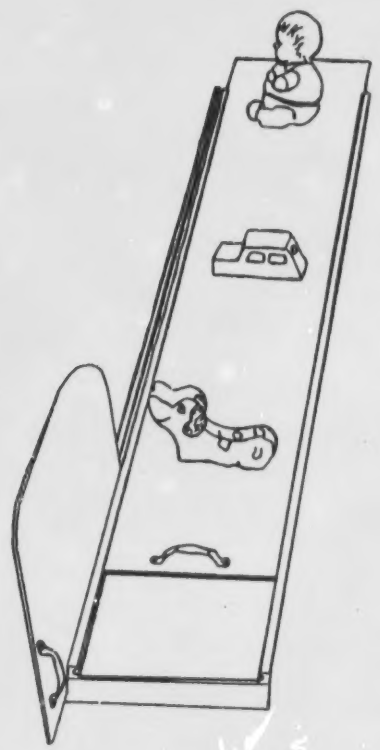
Table 4

Tasks Used in the Present Study

Percept Production Tasks
1. Show toy
2. Show card picture
a. Presented right side up
b. Presented upside down
3. Show block picture
a. O's eyes open
b. O's eyes closed
c. O's eyes covered
4. Show cube picture
5. Show S's back
6. Show large, immovable object
7. Show stick picture
8. Show from behind screen
a. S's hand
b. The stick picture
9. Show on toy panel
a. Support board movable, obstacle board fixed
b. Support board fixed, obstacle board movable
10. S points
Percept Deprivation Tasks
11. Hide on toy panel
a. Support board movable, obstacle board fixed
b. Support board fixed, obstacle board movable
12. Hide large, immovable object
13. Hide S
14. Hide S's hands
Percept Diagnosis Tasks
15. O looks
a. Eyes-face convergent
b. Eyes-face divergent
16. O points

Figure 1

Toy Apparatus



(from: Lempers, Flavell, and Flavell, 1977)

Administration of Communication Tasks

The battery of 23 tasks was administered to each child individually during one, or if necessary, two sessions. Most children required only one session; however, if a child grew tired or irritable, or if the session was excessively long, a second session was used. All tasks were administered in an available room at each center. An average session lasted approximately 30 minutes, with a range of about 15 minutes to 45 minutes.

The tasks were administered according to a modified clinical format. The emphasis of task administration was on determining whether or not a given child had certain perspective-taking or communication behaviors in his or her behavioral repertoire; the experimenters, therefore, made every effort to maximize opportunities for the child to respond.

Two experimenters were present during each session. One played the role of the "other" and was responsible for direct interaction with the child. The second experimenter presented stimulus materials, coded all of the child's responses, and accompanied the child in some tasks, such as those which involved standing behind a screen.

Appendix F contains complete descriptions of all tasks and procedures for their administration. There were several differences in this procedure from that followed in the study by Lempers et al. (1977). The first difference was

that the items in this study were administered in a systematic fashion. All items were administered to each child, except under the following conditions: (1) the session ended early due to child fatigue or irritability; (2) it was clear that the child had no hiding skills, in which case the rest of the hiding items were omitted. Lempers et al., on the other hand, did not administer all items to every subject. Rather, they assumed that if certain more difficult skills were demonstrated, then a few easier ones could be safely assumed. Since the present study used a population quite different from that of Lempers et al., such assumptions did not seem warranted.

A second difference was that the subject's mother was not present in this study. However, two of the nonretarded children would not participate unless their teacher was present during the session. The teacher was thus allowed to accompany these children, but did not participate in any way in the tasks.

A third, but minor, difference was that, in contrast to the Lempers et al. study, a doll was not used as a prompt to elicit child response. Lempers et al. had included the use of the doll as a substitute for the "other" when a child failed to response to certain task items. For example, the experimenter might say something like, "Now show the dog to the dolly."

Additional Procedures

Within two weeks of the administration of the communication tasks at each center or preschool, the teachers completed a Social Maturity Rank protocol and a Vineland Social Maturity Scale form for each child included in the study.

Following completion of all procedures, workshops were held to provide feedback to interested teachers and parents. Although such information dissemination was offered to parents and school personnel from each preschool or center, only those from the developmental day care centers requested these meetings.

Recording and Scoring of Responses

The original coding categories of Lempers et al. were used for coding children's responses to the communication tasks. A sample protocol is included in Appendix G. Each task was coded directly during the session. If the child's response did not fit one of the coding categories, it was recorded and described under the category of "other." Additionally, relevant anecdotal data from each session were recorded directly onto the scoring form. These anecdotal reports were later used to summarize child behavior or status, to record unusual or humorous occurrences, and to aid in interpretation of the communication task data.

For the purpose of analysis, all responses were coded "no credit," "partial credit," or "complete credit." A complete list of coding categories for each task is contained

in Table 5. "No credit" responses received numerical codes from 1 to 10. Hence, a subject could receive no credit for an item because he or she refused the item, threw the object across the room, did not comprehend the task, etc. "Partial credit," identified by numerical codes from 11 to 20, was assigned to responses which were incorrect, but which represented some attempt to perform the task. As indicated in Table 5, the number and types of partial responses (and, likewise, of no credit and complete responses) varies with the specific task item. "Complete credit" for an item, indicated by a numerical code anywhere from 21 to 30, was assigned to a correct response. This means that the subject did, in fact, successfully complete the task (i.e., show toy, etc.).

Reliability

The children's responses to the communication tasks, which were recorded during each session by one of the two experimenters, were all scored later by one experimenter according to the "no credit," "partial credit," "complete credit" system described above. The other experimenter scored 25% of the total group of protocols. Reliabilities, calculated separately on the data from the retarded and non-retarded subjects, averaged 93% (range = 70% to 100%) for retarded subjects and 92% (range = 78% to 100%) for non-retarded subjects.

Table 5

Coding Categories or Strategies

Task	Level of Coding		
	"No Credit"	"Partial"	"Complete"
1. Show toy	No response Refused or threw object; pushed it away Other - incorrect	Shows horizontally Other - correct	Shows vertically Shows unoriented Pushed toward O Pointed Other - partial
2a. Show card picture (right-side up)	No response Refused or threw object; pushed it away Other - incorrect	Gives Shows horizontally Shows vertically, unoriented Pushed toward O Pointed Other - partial	Shows vertically right side up Other - correct
2b. Show card picture (upside down)	No response Refused or threw object; pushed it away Other - incorrect	Gives Shows horizontally Shows vertically, unoriented Pushed toward O	Shows vertically, right side up Other - correct

59

Table 5 (continued)

Task	Level of Coding		
	"No Credit"	"Partial"	"Complete"
2b. (continued)		Pointed Child re-orients picture Other - partial	
3a. Show block picture	No response Refused in some way Other - incorrect	Gives Shows horizontally Shows vertically, unoriented Pushing Pointed Other - partial	Shows vertically, right side up Other - correct
3b. Show block picture (O's eyes closed)	No response Refused in some way Other - incorrect	Stares Gives Opens eyes, no show Shows, eyes closed Shows closely, eyes closed Pointing Pushed toward O	Opens eyes, shows Child tells O what to do Other - correct

60

Table 5 (continued)

Task	Level of Coding		
	"No Credit"	"Partial"	"Complete"
3b. (continued)		Touched or poked at O's hands or eyes Other - partial	
3c. Show block picture (O's eyes covered)	No response Refused in some way Other - incorrect	Stares Gives Moves hands, no show Shows, covered eyes Shows closely, covered eyes Picture between hands and eyes Poked or touched hands to move them Pointed Child covers own eyes Other - partial	Moves hands, shows Child tells O what to do Other - correct
4. Show cube picture	No response Refused in some way Other - incorrect	Points Gives Shows cube, not picture	Shows picture, right side up Other - correct

61

Table 5 (continued)

Task	Level of Coding		
	"No Credit"	"Partial"	"Complete"
4. (continued)		Shows picture unoriented Shows cube, open end up Other - partial	
5. Show S's back	No response Doesn't know body parts Refused Other - incorrect	Points to back Needs to be shown O's or E's back first Other - partial	Turns back Other - correct
6. Show large, immovable object	No response Unreliable response Other - incorrect	Points to object Other - partial	Turns O S walks O to another door S commands O Other - correct
7. Show stick picture	No response Other - incorrect	Gives Shows horizontally Turns partially Points to bunny Other - partial	Turns fully Other - correct

62

Table 5 (continued)

Task	Level of Coding		
	"No Credit"	"Partial"	"Complete"
8a. Show from behind screen (S's hand)	No response Refuses Incorrect	Goes around and shows Shows and peeks Peeks through cracks Pushes hand up against screen Other - partial	Shows hand(s) only Puts hand(s) through crack Other - correct
8b. Show from behind screen (stick picture)	No response Refuses Other - incorrect	Goes around and shows Shows and peeks Peeks through crack Pushes up against screen Other - partial	Shows picture only Puts rabbit through crack Puts rabbit over top Other - correct
9a. Show on toy panel (support board movable only)	No response Too difficult for child to manipulate Unreliable Other - incorrect	Points to object Grabs toy; tries to pick it up Other - partial	Slides board Showed by some other means Other - correct
9b. Show on toy panel (obstacle board movable only)	No response Too difficult to manipulate	Points to object Grabs toy; tries to pick it up	Slides board Showed by some other means

63

Table 5 (continued)

Task	Level of Coding		
	"No Credit"	"Partial"	"Complete"
9b. (continued)	Unreliable Other - incorrect	Other - partial	Other - correct
10. S points	No response Unreliable Refuses Other - incorrect	Looks from O to X Other - partial	Points at X Points at X, looks at O Points to screen Other - correct
11a. Hide on toy panel (support board movable only)	No response Too difficult to manipulate Unreliable Other - incorrect	Shows Grabs toy; tries to pick it up Points Other - partial	Hides Hides by some other means Other - correct
11b. Hide on toy panel (obstacle board movable only)	No response Too difficult for child to manipulate Unreliable Other - incorrect	Shows Grabs toy; tries to pick it up Points Other - partial	Hides Hides by some other means Other - correct
12. Hide large, immovable object	No response Refuses	Points to object Other - partial	Turns O Creates obstacle

64

Table 5 (continued)

Task	Level of Coding		
	"No Credit"	"Partial"	"Complete"
12. (continued)	Unreliable Other - incorrect		Moves O somewhere Pushes hand over O's eyes Commands O (to close or cover eyes, etc.) Other - correct
13. Hide S	No response Refuses Other - incorrect	Hides egocentrically Other - partial	Hides nonegocentrically Other - correct
14. Hide S's hands	No response Refuses Shows Other - incorrect	Hides whole self Other - partial	Hides Other - correct
15a. O looks (Eyes-face convergent)	No response Refuses Incorrect response No eye contact Other - incorrect	Looks at O Other - partial	Correct response Other - correct

Table 5 (continued)

Task	Level of Coding		
	"No Response"	"Partial"	"Complete"
15b. O looks (Eyes-face divergent)	Looks at O Other - partial	No response Refuses Incorrect response No eye contact Other - incorrect	Correct response Other - incorrect
16. O points	Looks at face Looks at hand Other - partial	No response No eye contact Other - incorrect	Looks toward object Other - correct

77

CHAPTER III

RESULTS

Study Purposes and Variables Reviewed

The following major questions were addressed as part of this descriptive study:

1. What are the fundamental social cognitive skills of young retarded children?
2. What are the characteristics and developmental features of such skills?
3. Are earlier findings on the development of fundamental communication skills in young nonretarded children replicable in a local sample of children from families of broader socioeconomic levels?

The dependent variables of this study were 23 basic communication skills tasks adopted from Lempers, Flavell, and Flavell (1977). Independent variables included social age, as determined by the Vineland Social Maturity Scale, and social maturity rank, as determined by an instrument developed for this study.

Approaches to Data Analysis

Results are presented in two parts, with data for the retarded subjects presented first and data for the nonretarded subjects presented second. Within each of these two sections descriptive statistics and correlational analyses are presented first, followed by Guttman scalogram

analyses.

Descriptive

Descriptive statistics were used to indicate the distribution of task variables and included measures of central tendency and range in the groups of retarded and nonretarded children. In addition, the strategies demonstrated by children on each task are displayed by social age for both the retarded and nonretarded groups, and by chronological age for the nonretarded group only.

Correlational analyses were used to explore the relationships between subject or classification variables (e.g., social age) and communication scale scores.

Guttman Scaling

The second level of data analysis involved a procedure known as Guttman scaling, which has been used previously in developmental research to examine ordinality and scalability of task items, and parallelism across domains of development (Rogers, 1977; Urberg & Docherty, 1976; Uzgiris & Hunt, 1975). This type of scalogram analysis can be performed using a number of commercially available computer programs, e.g., SAS (Barr, Goodnight, Sall, & Helwig, 1976), SPSS (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975), and SOUPAC (1973). Its importance for this study is that it provides a means for analyzing the underlying characteristics of the communication task items to determine whether their

interrelationships meet several special properties which define a Guttman scale.

The Guttman procedure tests whether the task items are unidimensional, i.e., all component items must measure movement toward or away from the same single underlying object or "universe of content" (Guttmann, 1944). In the present study there are three such universes of content--percept production, percept deprivation, and percept diagnosis--which require three separate Guttman analyses. The Guttman procedure also tests whether the component items in each group are cumulative, i.e., ordered by degree of difficulty such that subjects who reply positively to a difficult item will always respond positively to less difficult items and vice-versa.

In a perfect Guttman scale, items have a cumulative property which justifies the assumption of an ordinal scale. Items may be arranged from easiest to most difficult so that the exact response pattern of an individual can be reproduced from his/her total score. According to the literature on this topic (Blalock, 1972; Guttman, 1944; Nunnally, 1967; Uzgiris & Hunt, 1975), the perfect Guttman scale pattern as shown in Figure 2 is seldom obtained. There will always be individual subjects whose responses deviate from the ideal pattern and the question is whether or not to designate those responses as errors. The researcher must be willing to assume that a legitimate ordinal scale exists for the items in order to claim individual responses as errors. Of course,

Figure 2

Cumulative Pattern of Scalogram Analysis

	Items							
Scale Type	A	B	C	D	E	F	G	H
VIII	+	+	+	+	+	+	+	+
VII	+	+	+	+	+	+	-	-
VI	+	+	+	+	+	-	-	-
V	+	+	+	+	-	-	-	-
IV	+	+	+	-	-	-	-	-
III	+	+	-	-	-	-	-	-
II	+	-	-	-	-	-	-	-
I	-	-	-	-	-	-	-	-

(From Wohlwill, 1973)

if the number of errors is large, one may suspect the scale, but a relatively small number of errors is usually acceptable. This principle of a small number of errors supports the arbitrary decision to accept the items as an ordinal scale (Blalock, 1972; Guttman, 1944; Lingoes, 1963).

The coefficient of reproducibility (REP) is the actual measure of the number of errors in a Guttman scale. The REP may be obtained by counting up the number of responses which would have been erroneously predicted for each subject on the basis of his/her scale score, dividing these errors by the total number of responses and subtracting the resulting fraction from 1 (Lingoes, 1963). Guttman (1944) claimed that scales that are "85% perfect" or better have been used as approximations to perfect scales. The general rule for accepting the reproducibility of a scale is that the coefficient obtained is .90 or above (Lingoes, 1963).

The Guttman scaling programs also yield a coefficient of scalability which is similar to Green's (1956) index of consistency. Green's index is a modification of Guttman's scalogram analysis which uses summary statistics. Green states that a set of items for which the index of consistency (I, a coefficient of reproducibility corrected for chance reproducibility) is above .50 may be considered to form a scale. The coefficient of scalability is a ratio of how much the scale is improved over some baseline level of reproducibility. If the coefficients of reproducibility and scalability do not meet acceptable levels, the items are not

assumed to yield an ordinal scale and the underlying construct is not assumed to be unidimensional (Phillips, 1968).

Data Processing

In order to analyze data according to the Guttman procedure, all items or tasks must be scored dichotomously, e.g., where a "1" is equivalent to "pass" and a "0" is equivalent to "not pass." Hence, for the purpose of these analyses, only the response codes in the 21 to 30 range (see Table 5) were given a score of "1"; all partial and no credit responses were given a "0". Since the Guttman scaling technique assumes no missing data, two nonretarded subjects and six retarded subjects were eliminated from the scalogram analyses because these subjects did not complete the session.

Scalogram analyses for the percept production, percept deprivation, and percept diagnosis items were performed separately for the retarded and nonretarded groups. For the items in the percept deprivation and percept diagnosis groups, the Guttman procedure described in SAS (Barr, Goodnight, Sall, & Helwig, 1976) was used. This computer program accepts the items as being scalable if the criteria for unidimensionality and for a Guttman scale are met. Since use of the SAS program is limited to scales of 12 items or less, an alternative procedure was adopted for analyzing the 15 percept production task items. The computer program available in SOUPAC (1973) utilizes the multiple scalogram analysis procedure developed by Lingoes (1963). This procedure differs from Guttman scaling in the following ways:

(1) it is empirical rather than rational in determining scale membership; (2) it has the capacity for yielding multiple scales when the data demand it, rather than rejecting the scale hypothesis for the entire set of items when they are treated as a whole; and (3) it has a statistical rather than an heuristic decision basis for grouping items and for testing the scale hypothesis. Both computer programs yield a coefficient of reproducibility and an optimal order of tasks; however, they differ in readability and amount of output information.

Results for Retarded Subjects

The data from the retarded children included in this study will be presented in three parts. First, grouping characteristics of the retarded population will be described. Second, some descriptive analyses of the subjects' communication task performance will be presented, followed by the third section which contains the results of the scalogram analyses.

Grouping Variables

All retarded subjects obtained (a) a score on the skills checklist; (b) a social age (SA) score; (c) a social quotient (SQ); and (d) a social maturity ranking. Table 6 contains summary information for each of these variables, computed for the total group of 39 retarded children.

Although retarded subjects in this study were required

Table 6

Grouping Variables:
Retarded Subjects
(N = 39)

Variable	M	SD	Range
Skills Checklist[a]	18.64	6.26	6.00-30.00
Social Age[b]	2.82	1.2[illegible]	1.06-7.40
Social Quotient	61.28	21.[illegible]7	20.80-100.00
Social Maturity Rank[c]	64%tile		10-100%tile

[a]This is a numerical score, where 30 is the highest possible score.

[b]This is represented in years.

[c]This represents the teacher's rating divided by the number of children in the class.

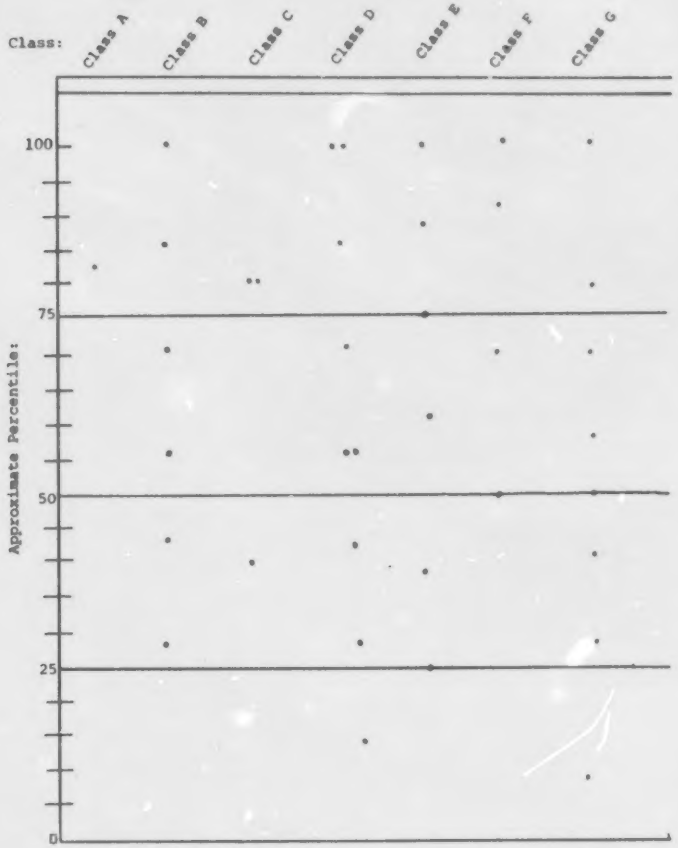
to pass a minimum of five items on the skills checklist, the mean checklist score was over 18. The average social maturity ranking of these subjects was at the 64th percentile, with some children ranked in the lowest 10th percentile of their class and others ranked at the top of the class with respect to their social maturity. Teachers generally defined social maturity as involving (a) interacting with peers, and (b) acting appropriately.

A graphic display of social maturity rankings for retarded subjects is shown in Figure 3. Only 37 retarded subjects received social maturity rankings because two children were seen on a special basis and their teacher felt she could not rank them relative to the rest of the children in her class. The procedure required teachers to rank all children in their class, not just those included in this study. However, only the social maturity rankings of the subjects participating in this study have been included in analyses and in Figure 3. Note that the distribution of the retarded children indicates wide variability along the dimension of social maturity.

The average social age (SA) for all retarded subjects was 2.82 years. For descriptive analyses all subjects were assigned to SA groups of 2 ($\leq$ 2.4 years), 3 (2.5 years to 3.5 years), and 4 (3.6 years to 4.8 years).

Figure 3

Social Maturity Rankings for 37 Retarded Subjects*



*N = 37 because two retarded subjects were seen on a special basis and the teacher could not rank them relative to the rest of a class.

Descriptive Data

Two of the major purposes of this study were: (1) to identify the social cognitive skills possessed by young retarded children, and (2) to describe the characteristics and developmental features of such skills. In order to meet each of these objectives, the performance of the group was examined separately for each of the 23 tasks.

Appendix H contains tables which illustrate the various task performance strategies utilized by the retarded subjects in their attempts to "communicate." For descriptive purposes, the strategies are grouped according to their level of sophistication or "correctness." The top section of each table contains those responses or task strategies that received "no credit" according to scoring procedures. The middle section contains those strategies which received "partial" credit. The bottom section contains correct or "complete" responses which received full credit.

The responses of the group are reported by the social age (SA) levels of two, three, and four. The numbers in parentheses indicate the number of children at each of the designated SA levels. Because the social age score of one retarded child (7.4 years) was outside the upper SA range, the total number of retarded subjects included in the analyses involving SA is 38. There are 17 children included in level SA-2, 12 children included in level SA-3, and 9 children included in level SA-4.

For each table included in Appendix H, each child's response is entered into the row that defines his/her best or highest level performance. Responses recorded in the upper section of each table received "no credit," responses recorded in the middle section received "partial credit," and responses recorded in the bottom section received "full credit." In a coding system giving credit for correct performance it is possible that children scoring in the "No response" and "Refuses" categories may have unidentified competencies. Although it is recognized that this could result in false negatives, for the purposes of this tudy these data were analyzed as scored.

Table 7 summarizes all of the data contained in Appendix H. In general, the higher the social age level, the greater the frequency of full credit responses. Alternately, children at social age level two gave more no credit responses than the children at social age levels three or four. Children at social age level three received partial credit for their responses to over half of the tasks.

It appears that the 15 items in the percept production domain (tasks 1, 2a, 2b, 3a, 3b, 3c, 5, 6, 7, 8, 8a, 8b, 9a, 9b, 10) do vary somewhat in difficulty. However, it is clear that for these items, the number of responses scored as "no credit" decreases as social age increases, and the number scored as "complete credit" increases as social age increases. Within the five items of the percept deprivation domain (tasks 11a, 11b, 12, 13, 14) some items such as 13 or 11b are relatively easier than others in that some

Table 7

Summary Table: Strategies of 38 Retarded Subjects
Tasks by Social Age

	Social Age Two (N = 17)			Social Age Three (N = 12)			Social Age Four (N = 9)		
Tasks	No Credit	Partial Credit	Complete Credit	No Credit	Partial Credit	Complete Credit	No Credit	Partial Credit	Complete Credit
1	2	9	6		9	3	1	1	7
2a	1	11	5	1	6	5		2	7
2b	2	11	4		8	4		2	7
3a	1	11	5		2	10		1	8
3b	4	13			12			5	4
3c	5	10	2		9	3		4	5
4	3	10	4	1	5	6		2	7
5	10	2	5	2	4	6	1	1	7
6	9	6	2	1	10	1	1	4	4
7	6	4	7	1	2	9		2	7
8a	6	7	4		7	5		5	4
8b	6	7	4		6	6		1	8
9a	7	7	3	4	5	3	1	2	6
9b	8	5	4	5	3	4	1	3	5
10	7	1	9	2		10	1		8
11a	11	4	2	7	3	2	2	2	5

Table 7 (continued)

	Social Age Two			Social Age Three			Social Age Four		
Tasks	No Credit	Partial Credit	Complete Credit	No Credit	Partial Credit	Complete Credit	No Credit	Partial Credit	Complete Credit
11b	11	3	3	6	3	3	2	2	5
12	12	3	2	4	7	1	4	2	3
13	12	1	4	2	2	8	2		7
14	14	2	1	7	2	3	5		4
15a	8	1	8	1		11			9
15b	12		5	3		9	4		5
16	1	1	15		1	11			9

children received partial or complete credit for them, and other items such as 12 or 14, are more difficult and not passed by most children. The three items in the percept diagnosis domain (tasks 15a, 15b, 16) appear to be either passed or not passed by all retarded children, as indicated by the small numbers of responses that received partial credit and the large numbers that received either no credit or complete credit.

In order to further explore the relationship between task category and social age, correlation coefficients were computed. Total scores for percept production, percept deprivation, and percept diagnosis items were obtained and correlated with social age. These communication task totals were obtained by giving all partial or complete responses a "1" and all no credit or incomplete responses a "0." Thus, scores on each task ranged from 0 to 1, total scores for the percept production tasks could range from 0 to 15, total scores for the percept deprivation tasks could range from 0 to 5, and total scores for the percept diagnosis tasks could range from 0 to 3. The reason that "partial" responses received a score of "1" when computing totals is that at least some degree of social awareness seems necessary in order to make a partial response. This is appropriate because the total scores are correlated with a global measure of social status, i.e., social age. The results indicate that the domains of percept production, percept deprivation, and percept diagnosis are significantly correlated with SA,

$r = .44$, $p < .01$, $r = .51$, $p < .001$, and $r = .43$, $p < .01$, respectively. A total communication task score for the 23 tasks, computed as described above, also correlated significantly with SA, $r = .50$, $p < .001$.

The distribution of communication task scores for retarded subjects is shown in Table 7A. As described above, each task was scored "1" for partial or complete responses, and "0" for incomplete or no credit responses. The mean scores given for individual tasks may also be interpreted as probabilities, e.g., the probability is 97% that retarded subjects will make at least a partial response to task 3a, but only 33% that they will do so on task 14.

Scaling Techniques

The results of the Guttman scalogram procedure for percept deprivation and percept diagnosis items are presented in Table 8. Both sets of items appear to be highly scalable, with coefficients of reproducibility above the criterion level of .90. The coefficient of scalability is essentially a ratio of how much improvement in reproducibility can be obtained relative to a baseline level of reproducibility. The coefficient of reproducibility indicates how well a scale can be reproduced given just a person's total score. The order of tasks which is most scalable using the Guttman model is presented in Table 8 for both percept deprivation and percept diagnosis domains. The tasks are listed in the table in order from most to least difficult.

Table 7A

Distribution of Communication Task Scores
for Retarded Subjects
(N = 39)

Tasks	Mean	S.D.	Range[a]
1	.92	.27	
2a	.95	.22	
2b	95	.22	
3a	.97	.16	
3b	.90	.31	
3c	.87	.34	
4	.90	.31	
5	.67	.48	
6	.72	.46	
7	.82	.39	
8a	.85	.36	
8b	.85	.36	
9a	.69	.47	
9b	.64	.49	
10	.74	.44	
Total Percept Production	12.44	3.94	2-15
11a	.49	.51	
11b	.51	.51	
12	.49	.51	
13	.59	.50	
14	.33	.48	
Total Percept Deprivation	2.41	1.87	0-5
15a	.77	.43	
15b	.51	.51	
16	.97	.16	
Total Percept Diagnosis	2.26	.88	0-3
TOTAL (23 tasks)	17.10	6.12	3-23

[a]This is given for total scores only, since the range for all 23 tasks is 0.0 to 1.0.

Table 8

Results from Guttman Scalogram Procedure
for Retarded Subjects
(N = 33)

Domain	Coefficient of Reproducibility	Coefficient of Scalability	Order of Tasks
Percept Deprivation	0.9152	0.7255	12, 14, 11a, 11b, 13
Percept Diagnosis	1.0000	1.0000	15b, 15a, 16

The scaling of the 15 items in the percept production domain was done by multiple scalogram analysis. Only four scales of two items each were identified among the percept production items as shown in Table 9. Scale reproducibility for two-item scales is obviously high, as indicated by the coefficients of .9394 and 1.000.

Results for Nonretarded Subjects

The data collected from the nonretarded children are presented in this section. In keeping with the major purposes of this study, no direct statistical comparisons of data from the groups of retarded and nonretarded children

Table 9

Multiple Scalogram Analysis of Percept Production Items for Retarded Subjects (N = 33)

Scale	Tasks Included in Scale	Scale Reproducibility
A	3a, 4	1.0000
B	9a, 9b	0.9394
C	8a, 8b	1.0000
D	2a, 1	0.9394

will be made. However, analyses parallel to those for retarded subjects will test the replicability of previous findings and provide the basis for general comparisons.

Grouping Variables

Data collected on grouping variables for the nonretarded group were the same as those collected for the retarded group and included: (1) a skills checklist score; (2) a social age (SA) score obtained from the Vineland Social Maturity Scale (VSMS); (3) a social quotient (SQ) also obtained from the VSMS; and (4) a social maturity rank

obtained from teacher rankings of subjects' social maturity relative to all other children in their classrooms.

Summary statistics for each of these variables for the nonretarded groups as a whole are presented in Table 10. The average skills checklist, SA, and SQ scores of the nonretarded group are by comparison higher than those obtained for the retarded group. The rankings of the nonretarded subjects fell, on the average, in the 60th percentile along the dimension of social maturity. All teachers of the nonretarded preschoolers defined social maturity as including (a) the elements of positive social interaction, and (b) interest in or ability to relate to peers and the environment. Figure 4 contains the graphic display of social maturity rankings for all subjects. There appears to be wide variability in the social maturity rankings of this group indicating that the subjects included in the study were not homogeneous along this dimension.

Descriptive Data

In order to examine the developmental features and characteristics of fundamental social cognitive skills in nonretarded preschoolers the performance of these children was summarized separately for each of 23 tasks. The strategies used by the nonretarded children in solving the communication tasks are described in Appendix I. The format of the 23 tables in Appendix I is identical to that used in the 23 tables in Appendix H described earlier. The data from

Table 10

Grouping Variables:
Nonretarded Subjects
(N = 61)

Variable	M	SD	Range
Skills Checklist[a]	24.70	3.31	13.00-30.00
Social Age[b]	3.36	0.93	1.79-4.80
Social Quotient	104.02	11.36	84.00-132.00
Social Maturity Rank[c]	56%tile		6-100%tile

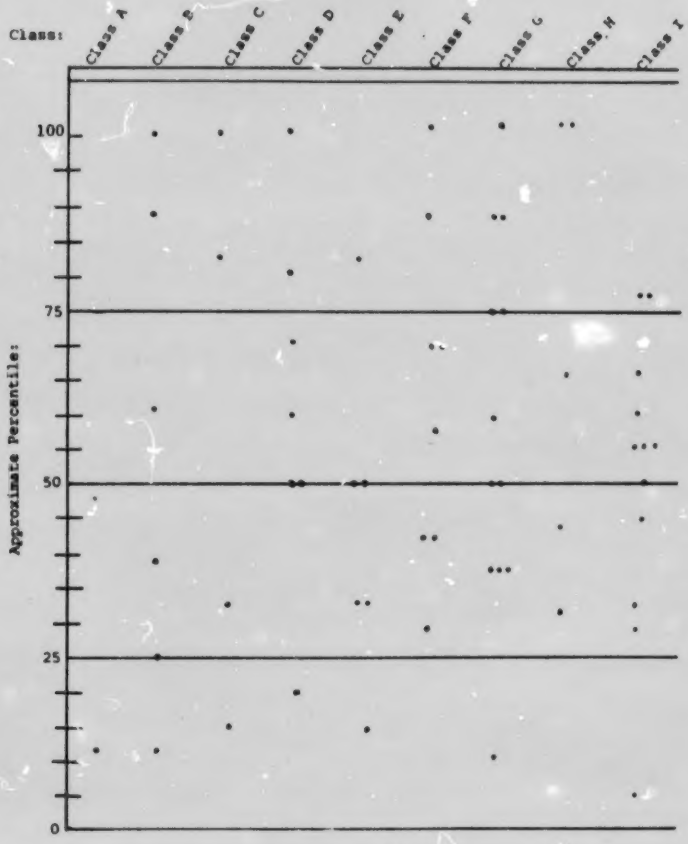
[a]This is a numerical score, where 30 is the highest possible score.

[b]This is represented in years.

[c]This represents the teacher's rating divided by the number of children in the class.

Figure 4

Social Maturity Rankings for
61 Nonretarded Subjects



the nonretarded children are presented by social age (SA) level, with 18 subjects at level SA-2, 11 subjects at level SA-3, and 32 subjects at level SA-4. For each task a child's response is entered into the row that defines his/her highest level of performance. Examination of the tables in Appendix I reveals that the higher the social ages of the children, the greater the frequency of responses scored as "complete credit." Conversely, at the lowest social age, level SA-2, there are more responses scored as "no credit."

Table 11 summarizes the 23 tables contained in Appendix I, clearly portraying the richness and variability of the nonretarded children's responses. For the 15 percept production items (tasks 1, 2a, ab, 3a, 3b, 3c, 4, 5, 6, 7, 8a, 8b, 9a, 9b, 10) children at social age two tended to give responses that received "partial credit." For example, on task 3a, requiring the child to show the picture on the block to the other person, a partial response might consist of the following: giving; showing the block with the picture unoriented; pushing; pointing. Most children at the social age level of four received "complete credit" for their responses, e.g., they showed the block in task 3a vertically and right side up so the other person could see it. The responses of children at social age three to the percept production items were intermediate in that they tended to be scored primarily as "partial credit" or else as "complete credit."

Table 11 (continued)

Tasks	Social Age Two			Social Age Three			Social Age Four		
	No Credit	Partial Credit	Complete Credit	No Credit	Partial Credit	Complete Credit	No Credit	Partial Credit	Complete Credit
11b	14	2	2	1	2	8		2	30
12	15	3		7	3	1	13	6	13
13	16	1	1	5	1	5	2	4	26
14	16		2	5		6	3		29
15a	3		15	1		10			32
15b	8		10	3	1	7	2		30
16	2		16	2		9			32

Correct performance on the five percept deprivation items (11a, 11b, 12, 13, 14) seems to increase rather directly with social age. Again, children at level SA-2 primarily gave responses that received "no credit;" children at SA-3 gave intermediate responses, i.e., their responses fell across the three scoring categories, and children at SA-4 primarily gave responses that received "complete credit."

Children's responses to the three items in the percept diagnosis domain (tasks 15a, 15b, 16) yielded a different pattern of responses. With the exception of one child at SA-3, the three groups of nonretarded children received either "no credit" or "complete credit" for these items, as shown in Table 11. In contrast to the tasks included in the percept production and percept deprivation domains, to which children responded with various degrees of sophistication or completeness, these percept diagnosis tasks appear to be dichotomous in nature, i.e., children either passed or failed them.

In order to further explore the relationship between the communication tasks and social age, correlation coefficients were computed using the data from nonretarded subjects. Total scores (which were obtained in the manner described in the previous section) for percept production, percept deprivation, and percept diagnosis were obtained for the nonretarded group as a whole. These three domains appear to be highly correlated with social age: $r = .49$,

$p < .0001$ for percept production; $r = .81$, $p < .0001$ for percept deprivation; $r = .45$, $p < .001$ for percept diagnosis. Total communication task scores also correlated with SA, $r = .72$, $p < .0001$.

Table 11A contains the distribution of communication task scores for nonretarded subjects. All tasks were scored as "1" or "0", as described in the section pertaining to data from retarded subjects. The mean individual task scores may also be interpreted as probabilities. Clearly, the probability of a nonretarded subject receiving credit for his/her response to a percept production task is high, ranging from 82% to 90%, whereas the probability of receiving credit for responses to percept deprivation tasks is lower, ranging from 43% to 75%.

In addition to identifying and describing the characteristics and developmental features of fundamental social cognitive skills in young children, a major purpose of this study was to determine if the findings of Lempers, Flavell, and Flavell (1977) are replicable with a local sample of children. Specifically, are the tasks age-related and developmental in nature? For this purpose, the strategies of nonretarded children were examined for each task by chronological age (CA) level. The three chronological spans utilized are at ages 2 (1 year 7 months to 2 years 6 months), 3 (2 years 7 months to 3 years 6 months), and 4 (3 years 7 months to 4 years 6 months). The age spans for 2- and 3-year-olds are similar to those used by Lempers et al. (1977).

Table 11A

Distribution of Communication Task Scores for Nonretarded Subjects (N = 61)

Tasks	Mean	S.D.	Range[a]
1	.98	.13	
2a	.98	.13	
2b	.97	.18	
3a	.78	.13	
3b	.97	.18	
3c	.97	.18	
4	.97	.18	
5	.87	.34	
6	.82	.39	
7	.93	.25	
8a	.93	.25	
8b	.95	.22	
9a	.90	.30	
9b	.88	.32	
10	.90	.30	
Total Percept Production	14.02	2.31	2-15
11a	.72	.45	
11b	.75	.43	
12	.43	.50	
13	.62	.49	
14	.61	.49	
Total Percept Deprivation	3.13	1.92	0-5
15a	.93	.25	
15b	.79	.41	
16	.93	.25	
Total Percept Diagnosis	2.66	0.75	0-3
TOTAL (23 tasks)	19.80	4.19	2-23

[a]This is given for total scores only, since the range for all 23 tasks is 0.0 to 1.0.

Appendix J contains 23 tables, similar to those in Appendices H and I which illustrate the nonretarded subjects' task performance in relation to their social age. The format and design of these tables, as well as instructions for reading them, are identical to those described previously. As indicated by the configuration of codes on these tables, the tasks appear to be age-related, such that more of the responses of 4-year-olds received "complete credit" than those of 2- and 3-year-olds.

Table 12 presents a summary of the data contained in Appendix J. The task performance of the 61 nonretarded children displayed by chronological age is visually quite similar to Table 11 which is displayed by social age. Children in the chronological age group two tended to give responses that received either "no credit or "partial credit;" children at chronological age three tended to give responses that received "partial credit" or "complete credit;" and most of the children at chronological age four gave responses that received "complete credit." The responses to task 3c, which required the child to show a picture on a block to another person whose eyes were covered with her hands, represent the above-mentioned pattern. Some sample "partial credit" responses to this task include: staring; giving; showing the block without moving the other's hands; pointing, etc. A "complete credit" response to this task would require the child to either move the other person's hands and then show the block, or to tell the other

Table 12

Table 12

Summary Table: Strategies of 61 Nonretarded Subjects Tasks by Chronological Age

Tasks	Chronological Age Two (N = 19)			Chronological Age Three (N = 18)			Chronological Age Four (N = 24)		
	No Credit	Partial Credit	Complete Credit	No Credit	Partial Credit	Complete Credit	No Credit	Partial Credit	Complete Credit
1	1	16	2		10	8		5	19
2a	1	14	4		4	14		4	20
2b	2	16	1		5	13		3	21
3a	1	14	4		4	14		4	20
3b	2	17			11	7		5	19
3c	2	17			10	8		3	21
4	2	14	3		7	11		4	20
5	5	8	6	2	5	11	1	2	21
6	7	12		3	7	8	1	1	22
7	4	11	4		2	16		3	21
8a	3	13	3		16	2	1	6	17
8b	3	14	2		13	5		5	19
9a	5	8	6	1	1	16		1	23
9b	7	6	6		1	17			24
10	5	1	13		1	17	1		23
11a	14	3	2	3	3	12			24

Table 11

Summary Table: Strategies of 61 Nonretarded Subjects
Tasks by Social Age

	Social Age Two (N = 18)			Social Age Three (N = 11)			Social Age Four (N = 32)		
Tasks	No Credit	Partial Credit	Complete Credit	No Credit	Partial Credit	Complete Credit	No Credit	Partial Credit	Complete Credit
1	1	14	3		10	1		7	25
2a	1	14	3		3	8		5	27
2b	2	14	2		6	5		4	28
3a	1	14	3		3	8		5	27
3b	2	16			9	2		8	24
3c	2	16			8	3		6	26
4	2	14	2		6	5		5	27
5	5	8	5	1	3	7	2	4	26
6	6	12		3	4	4	2	4	26
7	4	11	3		2	9		3	29
8a	3	13	2		8	3	1	14	17
8b	3	14	1		7	4		11	21
9a	4	8	6	2	1	8		1	31
9b	6	7	5	1		10			32
10	5	2	11			11	1		31
11a	14	3	1	3		6		1	31

Table 12 (continued)

Tasks	Chronological Age Two			Chronological Age Three			Chronological Age Four		
	No Credit	Partial Credit	Complete Credit	No Credit	Partial Credit	Complete Credit	No Credit	Partial Credit	Complete Credit
11b	14	2	3	1	4	13			24
12	16	3		10	6	4	9	3	12
13	16	2	1	7	2	9		2	22
14	16		3	6		12			24
15a	3		16	1		17			24
15b	9		10	3	1	14	1		23
16	4		17	2		16			24

Table 13

Results from Guttman Scalogram Procedure for Nonretarded Subjects (N = 59)

Domain	Coefficient of Reproducibility	Coefficient of Scalability	Order of Tasks
Percept Deprivation	0.9322	0.8058	12, 13, 14, 11a, 11b
Percept Diagnosis	0.9887	0.8750	15b, 15a, 16

what to do so that she could see the picture.

Finally, correlation coefficients were computed on these data from the nonretarded subjects. Total scores from each of the three domains--percept production, percept deprivation, and percept diagnosis--correlate significantly ($r = .51$, $p < .0001$, $r = .78$, $p < .0001$, and $r = .47$, $p < .001$, respectively) with chronological age. Chronological age also correlated significantly with total communication task scores, $r = .72$, $p < .0001$.

Scaling Techniques

The results of Guttman scalogram analyses of percept deprivation and percept diagnosis items are contained in Table 13. For percept deprivation, both the coefficient of reproducibility and the coefficient of scalability are

significant and above acceptable levels (Guttman, 1947), at 0.9322 and 0.8058, respectively, and provide evidence that the five items comprising the deprivation dimension are indeed scalable. The order of tasks which is most reproducible is also shown in the table; with the exception of the placement of task 13 (i.e., subject hides him/herself), this order is identical to that obtained in the same analysis using data from retarded subjects.

The percept diagnosis items are also highly scalable, with a coefficient of reproducibility of 0.9887 and a coefficient of scalability of 0.8750. The order of diagnosis tasks which is most scalable with nonretarded children is identical to the order generated for retarded children --15b, 15a, 16.

Given the large number of percept production variables, the data from tasks 1 through 10 for nonretarded subjects were analyzed according to a multiple scalogram analysis program (SOUPAC, 1973) as they had been for retarded subjects. Three separate scales consisting of at least two items each were identified among the 15 percept production variables. Table 14 shows the scale reproducibility values for these three scales. Scale A includes nine tasks with a scale reproducibility of above .90 which are most scalable in the following order: tasks 10, 9b, 9a, 3a, 2a, 4, 6, 3b, and 8a. These nine tasks were then examined as a single scale using the SAS Guttman scaling program in order to obtain separate coefficients of reproducibility and

Table 14

Comparison of Multiple Scalogram Analysis and Guttman Scaling of Percept Production Items for Nonretarded Subjects (N = 59)

Procedure	Scale	Coefficient of Reproducibility	Coefficient of Scalability	Order of Tasks
Multiple Scalogram Analysis of 15 Items	A	0.9058	____*	10, 9b, 9a, 3a, 2a, 4, 6, 3b, 8a
	B	0.9492	____*	5, 3c
	C	0.9342	____*	2b, 1
Guttman Scaling of 9 Items	A	0.9058	0.7159	10, 9b, 9a, 3a, 2a, 4, 6, 3b, 8a

*This figure is not provided by the SOUPAC program.

scalability. The results of this secondary procedure, which yielded an identical order of tasks, are also shown in Table 14.

Post-Hoc Exploratory Analyses

The process of Guttman scaling has been criticized by Festinger (1947), Lingoes (1963) and others with the issue being the "significance" of a Guttman scale. Even if items or tasks have a respectable coefficient of reproducibility, they do not necessarily measure a single underlying construct. They may, in fact, be measuring a correlate of that construct. Other criticism has been directed at the criterion of reproducibility which may be spuriously high (Festinger, 1947).

According to the Guttman method, the experimenter selects a set of items that are relevant to some "universe" or construct, tests for unidimensionality, and if certain criteria are met, accepts the universe as being scalable. On the other hand, the method known as multiple scalogram analysis takes a sample of items and attempts to minimize the number of scales for a given set of relationships. This offers a more stringent test of scalability than the Guttman procedure, and utilizes a conceptual process similar to that involved in factor analysis. The multiple scalogram procedure is described by Lingoes (1963) as follows:

> [It] involves selecting an item from the set to be analyzed, finding that item among the remaining

> items which is most like it and having the fewest errors, determining the number of errors between the candidate item and all of its predecessors, and, finally, applying a statistical test of significance to adjacent item pairs. If both the error and statistical criteria are satisfied, then the item that last entered the scale is used to find an item most like it, etc. Whenever either the error or statistical criterion fails, however, the scale is terminated and another scale is started with a new item chosen from among those that remain, until that point is reached where the item set is exhausted. (p. 502)

Given the high coefficients of reproducibility for the Guttman scaling of percept deprivation and percept diagnosis items for both retarded and nonretarded groups (see Tables 8 and 13), a multiple scalogram analysis was performed on all of these items, using the program contained in SOUPAC (1973).

Results from Multiple Scalogram Analyses (MSA)

Multiple scalogram analysis of the data from retarded subjects indicated that the five percept deprivation items formed only a two item scale which had a scale reproducibility of 1.0000. However, a two item scale is not particularly useful, despite this high coefficient of reproducibility. The three percept diagnosis items yielded no multiple item scales. These results indicate that the items in both the percept deprivation and percept diagnosis domains may be measuring several skill areas or constructs.

Using the MSA procedure with data from the nonretarded subjects yielded somewhat different results. Four of the five percept deprivation items formed a good or useful scale

with a reprodubility of .9576. Two of the three percept diagnosis items also formed a scale with a reproducibility of 0.9831. These findings indicate that the percept deprivation tasks are considerably more scalable when data from the nonretarded rather than retarded children are used. The three percept diagnosis items did not form a good scale for either group, suggesting that these three items may represent at least two, and possibly three, different skills.

The results of the multiple scalogram analyses suggest that this procedure is testing something different than the regular Guttman scaling procedure; specifically, it is determining the number of scales or constructs represented by the items rather than testing for unidimensionality. The MSA is also a slightly more rigid process than Guttman scaling. As such, it may produce multiple scales from a set of items suggesting that the items themselves may reflect more than one construct or universe of content.

Data Summary

In keeping with the major purposes of this study, results have been presented in terms of: (a) detailed analyses of the strategies used by young retarded children and nonretarded preschoolers on selected social cognitive tasks; and (b) documentation of overall performance patterns and ordinality of task items within each task domain--percept production, percept deprivation,

and percept diagnosis.

Detailed analyses of the types of responses or strategies demonstrated on each task by retarded children at the social age levels of two, three, and four indicated that they use a wide variety of strategies in their performance of the tasks. In other words, the primary strategies used by most of the retarded children were those that indicated some awareness of the "other" person and of the problem at hand; "complete" strategies were much less evident in most of the retarded children's response repertoires. Furthermore, these analyses reveal that tasks which appear to be superficially similar in difficult level (e.g., showing an object vs. showing a toy) in fact differ substantially in the skills which they require. Total scores for percept production, percept deprivation, and percept diagnosis items also correlated highly with social age for the retarded group.

Similar detailed analyses were made of the performance patterns of the nonretarded children. The responses or strategies given for each task were displayed (1) by social age level of the nonretarded group (at the ages of 2, 3, and 4), and (2) by chronological age level of the group (also at the ages of 2, 3, and 4 years). The data displayed in Table 11 indicated that children at the social age of two had more difficulty passing or receiving credit for their responses to the communication tasks than children at the social ages of three or four. Similarly, the data displayed

in Table 12 indicated that the younger children, i.e., 2-year-olds, had difficulty with many of the tasks, whereas the 3- and 4 year olds did not, lending support for the expected developmental pattern. Correlation coefficients indicated that total scores for percept production, percept deprivation, and percept diagnosis items were significantly correlated with both the social age and chronological age of the nonretarded group as a whole. Like the original Lempers et al. study (1977) the tasks were shown to be strongly age related.

To clarify the extent to which the items within the three task categories fit a developmental sequence, several Guttman scalogram analyses were performed for both groups of children. Scalogram analyses of percept deprivation and percept diagnosis domains indicated that the tasks could generally be arranged into ordinal hierarchies, although the order of task arrangement could differ from that originally proposed by Lempers et al. (1977).

Percept production items, however, were not as highly scalable as the other items for either group of children. Multiple scalogram analyses identified no ordinal hierarchies larger than two items using the data from the retarded group. On the other hand, 9 of the 15 percept production items administered to the nonretarded preschoolers were shown to be highly scalable whether using the criteria of the multiple scalogram analysis or Guttman scaling procedure.

CHAPTER IV

DISCUSSION

The results of this study support the feasibility of systematically exploring specific social cognitive skills in young retarded children and nonretarded children at similar social age levels. This section will discuss these findings in detail, point out the limitations to the investigation, and raise some issues and questions concerning the development and measurement of fundamental social cognitive skills in young retarded and nonretarded children.

Specific Interpretation and Significance of Findings

Using a particular set of social-cognitive tasks, this study has demonstrated that retarded children functioning at developmental levels ranging from less than two years to four years can be assessed in the area of social communication. The data indicated that retarded children use a wide variety of strategies when presented with tasks involving rudimentary role-taking and referential communication skills. In general, retarded children at the social ages of three and four could indicate their awareness of the "other" person and of the problem at hand. However, social awareness in the mentally retarded is probably not fully developed in children at the social ages tested because only

one of these children received "complete credit" for all 23 tasks. Nevertheless, as found in this study, young retarded children are not restricted to any single strategy, but utilize a wide variety of strategies in attempting to solve social communicative tasks.

On the basis of the tasks administered in this study it is possible to describe the characteristics and developmental features of the retarded children's performance. It is clear that within each of the three major task categories of percept production, percept deprivation, and percept diagnosis some items are relatively easier and "passed" by most children. Among these are tasks which require simple types of showing and pointing, e.g., tasks 1, 2a, 3a, or 15a. Other items are more difficult and "not passed" by most children. Tasks 6, 9a, 11a, or 12, which require more awareness of what the other person can or cannot see, are examples of items of such difficulty. Hence, the emergence of the social communication skills examined in this study appears to conform to a hierarchical sequence from simple to more complex items. This is particularly evident from the highly significant scalability achieved on the percept deprivation and percept diagnosis task items. Summary Tables 7, 11, and 12 lend support to this scaling procedure.

Although there was a lack of scalability of items in the percept production domain for the retarded group, there was some significant scalability within these items for the

nonretarded group. This discrepancy may be due, at least in part, to a number of factors. For example, it is generally difficult to produce reliable scales with multiple items, i.e., the more items there are, the less likely it is that a single scale can be extracted. Few scales with as many as eight items have been developed, whereas four-item and five-item scales are more common (Phillip, 1968). Also, the performance of the mentally retarded group, may be generally more variable than that of a nonretarded group, lessening the chance of obtaining a high coefficient of reproducibility. One must consider, too, that a developmental marker such as social age, as used in this study, may not produce results comparable to chronological age using the scaling procedure.

One seldom obtains a perfect scale because of the strict assumptions of the Guttman model (Blalock, 1972). However, Guttman (1944) has pointed out that obtaining "good" scales is relative to time and to populations. For example, in any given population a "universe" of items may be scalable at one time but not at another; or, it may be scalable at two periods of time but with different orderings of items or categories. Furthermore, a universe may be scalable for one population but not for another; or, it may be scalable for two populations but with different orderings of items or categories.

Finally, comparisons with respect to degree of scaling results can be made only if the same scaling obtains in both

cases or groups being compared. Even though there was a lack of significant scalability of the 15 percept production items for the retarded group, over half of these items formed a significant scale for the nonretarded group. With the possible exception of the three percept deprivation items, such direct comparisons between data from the retarded and nonretarded group are generally not appropriate.

The final purpose of this study was to determine if the findings of Lempers et al. (1977) were replicable with a local sample of nonretarded children without the restriction in socioeconomic status evident in the original sample. The findings of Lempers et al. were, in general, replicable, i.e., the tasks in the present study were shown to be related to both social and chronological age. However, it should be noted that the ages of the subjects in the two studies differ considerably, such that the typical three-year-old in the Lempers et al. study performed like a typical four-year-old in the present study. As pointed out earlier in the rationale for the present study, such age differences were expected, given the fact that Lempers, Flavell, and Flavell tested children of fairly high socioeconomic status in their own homes with their own mothers present. The subjects in this study, on the other hand, came from families of broader socioeconomic status and were tested at their day care centers without their mothers present. The age trends identified by Lempers et al., which "presumably reflect important developments in the area of

social interaction and communication, as well as with respect to cognition about percepts" (p. 5) were shown to appear slightly later in the present sample.

The results of scalogram analyses reported in Lempers et al. and in the present study differ considerably. First of all, Lempers et al. performed a factor analysis of their data which revealed the existence of two factors. They then scaled those factors separately. This procedure was not recommended for use in the present study (Appelbaum, Note 10; Nelwig, Note 11; Howes, Note 12) because the Guttman procedure itself tests for unidimensionality. Second, Lempers et al. had a large number of subjects who either passed all the items or failed all the items. According to Wohlwill (1973) the piling up of cases in these two extreme response patterns may result in a spuriously high degree of scalability. This problem of extreme response patterns was not apparent in the present study.

There is precedent in the developmental psychology literature for the "comparison reference group" approach taken in the present study (Kahn, 1976; Rogers, 1977; Urberg & Docherty, 1976), where the performance of the retarded group alone is examined with the goal of replicating some developmental pattern of results obtained from a nonretarded group, rather than making direct comparisons between the performance of retarded and nonretarded children on some test or series of tasks. For example, Rogers (1977) examined profoundly retarded children on a set of Piagetian tasks to

determine, among other things, whether their performance would replicate the invariant pattern found in normal infants, and to determine the role of mental and chronological age variables in sensorimotor performances. Rogers also used Guttman scalogram analyses to determine ordinality among items in each of several Piagetian domains. Kahn (1976) examined the utility of a set of tasks measuring sensorimotor development (i.e., the Uzgiris and Hunt Scales) with severely and profoundly retarded children. Scalogram analyses which were performed on these data indicated that the scales were reliable and ordinal with the retarded sample. The Uzgiris-Hunt Scale has also been shown to be related to adaptive behavior, as measured by the Alpern-Boll Developmental Profile (Wachs & DeRemer, 1978). Similarly, there is some evidence for a relationship between the social cognitive tasks used in the present study and social maturity, as measured by the Vineland Social Maturity scale.

Study Limitations

A major limitation to this study was that in attempting to extend a previously unexplored domain--the development of fundamental social cognitive skills--to young mentally retarded children, it raised a number of difficult methodological issues which merit discussion. These involve the grouping variables used, subject selection, task items, and Guttman scaling procedures.

Use of Grouping Variables

One of the major grouping variables used in the present study was the social age (SA) score derived from the Vineland Social Maturity Scale (VSMS). In the present study the limitations of the VSMS have been fully recognized; however, here it was not used to define the concept of social maturity, but to serve as a potential correlate of the social-cognitive skills that were being examined (see Appendix K). Due to the availability and ease of administration of the VSMS it was possible to estimate current social age scores (SA's) and social quotients (SQ's) for each child participating in this study. Furthermore, Doll (1965) has indicated that SA's are statistically and methodologically comparable to Binet MA's, and SQ's to Binet IQ's, at least for children younger than 15.

In addition to the VSMS, another more informal measure of social maturity was utilized in this study. Subjects were given a social maturity ranking score by their teachers; this provided a quantitative measure along a dimension from most to least socially mature. The teachers of the children in this study were asked to define social maturity so that a more accurate interpretation of the rankings could be made. The correlations between social maturity rank and social age, and between social maturity rank and total communication task score (where the maximum total communication score could be 23, with a "1" given for either a partial or complete response to a task, and a "0" given for any incomplete or no

credit response) were significant for the nonretarded children (r = .26, p < .05 and r = .32, p < .01, respectively) but they were not significant for the retarded group (r = .13, p < n.s. and r = .16, p < n.s., respectively). The social maturity ranking instrument was thus deemed too weak and lacking in supporting data to be included as a variable in the major analyses.

A final issue pertains to the use of mental age (MA) as a criterion for including subjects in this study. Criticisms of the use of MA for selecting subjects abound (Kappauf, 1975; Wohlwill, 1973), although it has been considered relevant in studies comparing nonretarded with retarded individuals (Brown, 1973; Wohlwill, 1973). In the present study, however, developmental or mental age was merely used to define the range from which the retarded population was selected.

Subject Selection

Due to the subject selection procedures employed in this study, (see Chapter II, Method), no direct statistical comparisons could be made between the retarded and nonretarded groups. If the groups had been matched on some relevant variable, perhaps such comparisons would be appropriate. However, matching variables such as CA, MA, or IQ has been recognized as methodologically weak (Kappauf, 1973). Furthermore, matching may produce the following problems (Appelbaum, Note 13): (1) it may actually introduce more bias into the sample; (2) it produces a sample that is definitely not random; (3) it may produce

an "outrageously unrealistic sample;" and (4) it is a particularly bad procedure to use when the two populations are quite different with respect to other relevant variables.

Another problem related to subject selection is the size of the retarded sample. It was possible to identify a small sample of retarded children who met the criteria for this study from within two local developmental centers. However, to increase the size of the retarded sample to 60 to make it equivalent to the nonretarded sample would have involved an unreasonable amount (in time and cost) of commuting.

Finally, special procedures were sometimes necessary for administering the 23 communication tasks to the retarded children. (These are described in Chapter II, Method). For example, some children required unique reinforcements, e.g., sitting in a rocking chair, eating M&M's, playing with a foam ball, making sign language symbols, etc. Because the administration of these tasks did not constitute a standardized test, but rather a criterion-referenced approach to social-cognitive development, adaptations were made which facilitated child tendency to respond, but which did not alter the tasks in any way.

Task Variables

Although the 23 tasks administered had been utilized previously (Lempers, Flavell, & Flavell, 1977) there was no available data on test re-test reliability or temporal

stability. For the purposes of this study, a certain amount of face validity was assumed. There is evidence in the literature that the skills which these tasks assess are "acts of social communication and instruments of social interaction" (Lempers et al., 1977, p. 48). However, these 23 tasks lack the complete theoretical and empirical support that, for example, supports the use of Piagetian sensorimotor tasks.

Guttman Scaling

Finally, some criticisms directed at Guttman scaling should be mentioned. First of all, computer programs capable of producing Guttman scales with more than 12 items are limited. There is a practical reason for this, however, i.e., since Guttman scaling is such a rigid analysis, it is almost impossible to produce a perfect scale. Given a large number of variables, such as 12 or more, the probability is slight that the items will meet a criterion of reproducibility. There is, too, the problem of reaching a high degree of scalability by chance, but the procedures followed and the items selected for use in the present study mitigated the likelihood of this problem.

Other criticisms of the underlying assumptions of the Guttman scale are as follows: (1) the present of the perfect triangular pattern of responses is a necessary but not sufficient condition for the fit of the model; (2) the triangular pattern is often artificially forced by dealing

with a small number of items that vary greatly in difficulty; and (3) the model aspires only to develop ordinal scales (Nunnally, 1967). Given the precedent of using Guttman scaling in psychological/educational research (Kahn, 1976; Rogers, 1977; Urberg & Docherty, 1976; Uzgiris & Hunt, 1975) and the fact that a major purpose of this study was to test for ordinality among the social-cognitive task items, the Guttman procedure seems to be clearly appropriate.

Issues and Questions Raised

As a descriptive, exploratory study, this investigation raised a number of issues and questions. First, this study highlights the importance of studying social cognition or social competence in children at very early ages. The fact that fundamental social communication skills of young retarded children could be assessed at all should be encouraging to others interested in this area and should stimulate extensions and elaborations of this research study. Second, the mentally retarded population involved in this study is one which is rarely used in basic research of this type, despite the fact that it is this population which may gain the most from a more complete understanding of the skills which underlie the development of social competence.

A third issue raised is the relationship between language ability and performance on social cognitive tasks like the ones employed in this study. All 23 tasks administered required a nonverbal response on the part of the subject, yet

many children supplemented their nonverbal or behavioral responses with spoken descriptions of what they were doing. Clearly, there are some continuities between pre-speech communication and language (Bruner, 1978). One explanation for this developmental progression, derived from Piaget's work, is that language is facilitated by the development of sensorimotor schemas that represent joint outcomes of perception and action. Piaget (1951, 1963) hypothesized that individuals should not be expected to show speech until stage six of the sensorimotor period. Kahn (1975) showed that this relationship holds in profoundly retarded children between the chronological ages of 47 to 98 months. It would be interesting to know at what Piagetian stage level the retarded subjects in this study were functioning and how that level of cognitive functioning relates to their linguistic as well as social-cognitive abilities. Some children do rely on gestures and pointing as strategies for communicating (Clark, 1978). The skills assessed by the tasks in this study may well be important for later verbal communication.

Another issue raised by this research study is the possible role of environmental factors in fostering early social communication skills. For example, how directly does peer interaction affect social-cognitive skill development? This is a puzzling question, since the children in the Lempers et al. (1977) study who were administered the communication tasks at home did at least equally as well as the

nonretarded subjects in this study (who were older and attended some form of day care all week). On the other hand, research on the integration of handicapped or nonhandicapped children in day care or preschool settings suggests that this type of setting enhances positive social interactions between the handicapped and nonhandicapped children (Apolloni & Cooke, 1978; Cooke, Apolloni, & Cooke, 1977; Devoney, Guralnick, & Rabin, 1974; Peterson & Haralick, 1977; Snyder, Apolloni, & Cooke, 1977). If a direct relationship of peer interaction, prosocial behavior and the development of social-cognitive skills can be demonstrated (as suggested by Shantz, 1975) specific recommendations for educational environments could be made.

A final issue to be raised regards the notion of scaling test or task items. The use of infant tests which have been standardized on populations of nonhandicapped children, e.g., Uzgiris-Hunt Scales, with exceptional populations is commonplace. However, while some researchers have examined the scalability of these test items when administered to handicapped populations (Kahn, 1975; Kahn, 1976; Wachs & DeRemer, 1978), this is not a general procedure. In the present study it was shown that task items which were highly scalable with the nonretarded group were not similarly scalable with the retarded group. This suggests that perhaps ordinality and scalability of items on scales to be used with exceptional populations should be explored in this regard.

CHAPTER V

CONCLUSIONS

The present study grew out of a recognition of the need for more basic research in social-cognitive development with chronologically young children and with developmentally young retarded children. An exploration of the development of fundamental role-taking and communication skills is important for understanding the socialization of all children, and particularly for understanding the deficits in the socialization process, e.g., the lack of social competence, among handicapped children. As such, the findings of this study have implications for research and for practice, as outlined below.

Implications for Research

Basic research in the area of social-cognitive development is important to test the utility of the currently proposed developmental approaches to the study of social cognition (e.g., Flavell, 1966, 1972, 1974; Flavell, Botkin, Fry, Wright, & Jarvis, 1975; Kurdek & Rodgon, 1975; Piaget, 1965, 1967; Selman, Note 4; Urberg & Docherty, 1976). Research on specific components of social cognition, such as role-taking and communication, provides a more complete picture of the development of social awareness in the child. This is

helpful in designing measures to assess strengths and deficiencies in basic social cognitive skills of children.

Methods or materials for assessing social competence or social cognition in handicapped children already exist, as described previously. Research has already shown, for example, that some retarded individuals do have the necessary component skills for performing competently in interpersonal situations (Affleck, 1975a, 1975b, 1976). Hence, a person who is intellectually retarded does not necessarily have to be socially incompetent. Variability in role-taking skills among the retarded cannot be explained by level of intelligence alone, but may depend on the types of experiences they have had. This suggests that specific interventions to enhance role-taking skills may be effective. Some of these interventions have been demonstrated; others need further exploration. Evidence supporting intervention to promote social competence (i.e., through the development of social-cognitive skills) comes from experimental studies and clinical reports with specific exceptional populations (Chandler, 1973; Chandler, Greenspan, & Barenboim, 1974).

In a recent study (Blacher-Dixon & Simeonsson, 1978), for example, retarded children of comparable intelligence and age were grouped according to high, intermediate, or low role-taking ability. An experimental task, in which children were required to adopt perspectives or viewpoints different from their own, i.e., to "stand in the shoes of another person," was then administered to promote role-taking

performance. The procedure was found to be differentially effective, in that the performance of the high and low groups remained unchanged across two testings, whereas the intermediate group improved after the experimental intervention. In a follow-up study (Blacher-Dixon & Simeonsson, Note 14) the stability of role-taking in these retarded children over a one-year interval was shown.

Thus, experimental intervention efforts aimed at improving the development of, or increasing the use of, specific component skills of social cognition have been found to be successful. Extensions to younger populations are needed. Like most research on intervention, however, the direct effects of these previous attempts need to be documented before wide-scale programs to promote social competence can be implemented.

There are a number of logical extensions of this study which might be fruitful areas for research. First, the task items used could be revised or updated, eliminating those which had high error probabilities. The new set of communication items could then be retested for scalability; if the items are indeed ordinal, they could later be used as an informal test of social-cognitive skills. It might also be interesting to determine whether these fundamental social communication skills are predictors of later socially competent behavior, particularly in retarded individuals. Such longitudinal research would be particularly important for identifying optimal conditions for intervening and

promoting retarded children's social-cognitive skills.

Implications for Practice

The potential diagnostic uses of tasks like those employed in the present study have been confirmed by early childhood teachers and special education personnel contacted regarding this study. The approach of diagnosing role-taking or communication deficits and then developing appropriate curriculum plans to remediate those deficits has particular appeal because of the perceived relevance of these skills to the social development of retarded children. The goal of Longhurst's (1972) research on the development of referential communication skills, for example, is to develop operant procedures to improve the describing skills of mentally retarded children. Reich (1978) has developed a language training program for moderately retarded preschoolers which involves the use of gestures to accompany the oral presentation of words. The results indicated that such nonverbal gestures do facilitate children's spontaneous use of target words in a classroom setting.

Some potential uses of the actual communication tasks used in this study include: (1) the development of a criterion-referenced checklist approach to assessing social-cognitive development in young retarded children; (2) the development of curriculum materials to enhance social competence and awareness; and (3) the implementation of systematic

training in fundamental communication or social-cognitive skills. In time, even more direct applications of social cognitive-research to classroom and instructional environments can be expected.

APPENDICES

Appendix A

Summary of Social Intelligence Measures

Appropriate Age Range:	SI COMPONENTS*			
	ROLE-TAKING: PERCEPTUAL	ROLE-TAKING: COGNITIVE	ROLE-TAKING: AFFECTIVE	SOCIAL INFERENCE
18-24 months	Lempers, Flavell & Flavell (1977) Masangkay et al. Part I (1974)	Mossler, Marvin & Greenberg (1976)	Sagi & Hoffman (1976)	
36 months and 48-60 months	Blacher-Dixon & Simeonsson (1978) Borke (1975) Chandler, Helms & Smith (1974) "Droodles" Fishbein, Lewis & Keiffer (1972) Flavell, et al. (1968) New Instruments (in preparation) Libin (1978) Masangkay et al. Part II (1974) Salatas & Flavell (1976) Wilson & Shantz (1977) Zahn-Waxler, Radke-Yarrow & Brady-Smith (1977)	Devries (1970) Greenberg, Marvin & Mossler (1977) Marvin, Greenberg & Mossler (1976) Mossler, Marvin & Greenberg (1976) Zahn-Waxler, Radke-Yarrow, Brady-Smith (1977)	Borke (1971) "Interpersonal Perception Test" (IPT) (1957) Mood, Johnson & Shantz (1978) Burns & Cavey (1957) Chan & Omori (1978) "Affect Role-Taking Instrument" (ARTI) Deutsch (1975) Deutsch & Madle (1975) Feshbach (1973) Feshbach & Roe (1968) "Feshbach and Roe Affective Situational Test for Empathy" (FASTE) Flavell, et al. (1975)	Edmonson (1974) "Test of Social Inference," (TSI) New Instrument (in preparation)

* If a specific test name does not follow a reference, the authors used some experimental task or manipulation.

Appropriate Age Range	SI COMPONENTS				
	SOCIAL COMPREHENSION	PSYCHOLOGICAL INSIGHT (PERSON PERCEPTION)	MORAL JUDGMENT/ DEVELOPMENT	REFERENTIAL COMMUNICATION	SOCIAL PROBLEM-SOLVING
18-24 months					
36 months & 48-60 months	Furth (1976) Heise & Roberts in Johnson (1976) "Role Knowledge Test" Wechsler (1967) "Comprehension Subtest" (WPPSI)	New Instruments (in preparation)	Damon (1975; 1977) Irwin & Moore (1971) King (1971) New Instruments (in preparation)	Maratsos (1973) Meissner & Apthorp (1975) Monson, Greenspan & Simeonsson (1979) "Communicating All Necessary Steps" (CANS)	Chan, Smith & Reid (1978) "Interpersonal Tactics Scale" (ITS) Greenberg, Marvin & Mossler (1977) Shure & Spivack in Johnson (1976) "Preschool Interpersonal Problem-Solving Test" (PIPS) New Instruments (in preparation)

Appendix B

Skills Checklist

ID#_____

Name_____

As the teacher of the child named above, please place a check beside the skills listed below that this child can do. If you have not personally observed this child demonstrating a particular skill, but you feel confident that the child does have that competency, you may still place a check. You might recognize many of the items from the Learning Accomplishment Profile (Sanford, 1974).

THIS CHILD CAN . . .

_____Hear verbal commands from within 5 ft. of speaker (with or without the use of aids)

_____See, i.e., has vision acceptable for normal purposes (with or without the use of aids)

_____Stand alone

_____Move alone

_____Pick up toy (from floor or table)

_____Carry toy while moving or walking

_____Idantify pictures in book ("Find Ball")

_____Responds to the command "show" or "show me"

_____Attain sitting position unaided

_____Responds to the command "hide" ("Hide the ball")

_____Turn knob

_____Point to parts of doll on request

_____Get down from chair without assistance

_____Ask for wants by naming objects

_____Give one word response

_____Write letters

_____Name pictures of common objects (for ex: airplane, ball, ship, hat)

_____Follow 3 commands in proper order

_____Act out stories

_____Give age and birthday

_____Comprehend prepositions on top of, under, inside

_____Learn left from right

_____Understand numbers up to 10

_____Push or pull objects, such as toys

_____Imitate simple actions, such as clap hands, touch nose, etc.

_____Indicate desires by gesturing and/or utterances

_____Name familiar picture cards

_____Comprehend "another"

Respond correctly to either of the following requests:

____(a) "Give me _____"

____(b) "Put the ____ on the _____"

Are edible reinforcers effective with this child? Please circle:

YES NO

If so, what edible reinforcers work best?_____

If this child has any dietary restrictions, please specify:

_____

If food reinforcers should not be used with this child, what type of reinforcers do you recommend?

_____

THANK YOU VERY MUCH FOR YOUR HELP.

Appendix C

Documentation of Retardation

Appendix C

Documentation of Retardation

Subject	Available Test Data[a]	Etiology/Diagnosis
100	7/10/78: Bayley Ratio IQ = 55	Down's Syndrome Moderate MR Chromosome abnormality
101	8/9/78: Bayley Derived IQ = 55	Moderate MR Palsy
102	5/16/77: Bayley Derived IQ = 28 Denver 14-16 mos.	Severe MR Seizure disorder Possibility of severe environmental deprivation or abuse Developmental delay
103	8/23/78: Bayley Derived IQ = 49	Moderate MR Nerve palsy Developmental delay
106	9/28/77: Stanford Binet IQ = 40	Moderate MR Occipital encephaly
108	5/5/76: Bayley Ratio IQ = 66	Down's Syndrome Mild MR
110	11/19/74: Cattell Functioning 12-12.5 mos. Derived IQ = 74 10/74: Vineland SQ = 75	CP Borderline spastic quadraparesis

[a]Ratio IQ's were available in some children's files, obtained by (DA/CA) x 100 = IQ, where DA = Developmental Age. A derived IQ is a ratio IQ calculated by the experimenter.

Subject	Available Test Data		Etiology/Diagnosis
112	7/15/77:	Bayley Ratio IQ = 42	Moderate MR Seizure disorder General developmental delay
113	6/23/77:	WPPSI full scale IQ = 68 PPVT IQ = 31	Mild MR Encephalitis Seizures, herpes, etc.
116	5/8/78:	Stanford Binet IQ = 66	CP Mild MR Seizure disorder
117	5/28/75:	Bayley MDI = 39 PDI = 38	Severe mental and motor retardation Congenital encephalopathy
118	2/16/78: 2/2/77:	Bayley Ratio IQ = 18 Vineland SQ = 48	Profound MR Seizures Encephalopathy
120	4/7/75:	Cattell IQ = 26	Severe MR Hydrocephalus
121	7/12/78:	Bayley Derived IQ = 60	Possible emotional and cognitive deprivation
123	9/29/76:	Test not listed IQ = 81	Borderline MR Central processing deficiencies
124	8/17/77: 9/6/78:	Bayley Alpern Boll Derived IQ = 77	Down's syndrome

Subject	Available Test Data		Etiology/Diagnosis
125	8/17/77:	Bayley (no ceiling) Derived IQ = 51	Meningitis, possibly
126	2/10/78: 3/2/77:	Merrill Palmer Scale of Mental Tests Ratio IQ = 51 Vineland SQ = 34	Moderate MR
127	5/10/78:	Not listed	Moderate MR Hydrocephaly
200	6/20/77:	Bayley Ratio IQ = 69	Mildly delayed; MR Speech & fine motor problems
201	9/23/77:	Bayley Derived IQ = 52 Vineland SA = 23 mos. SQ = 61	Down's syndrome
203	9/16/77:	Bayley Derived IQ = 41 Vineland SA = 21 mos. SQ = 60	Moderate MR Microcephaly Mild CP
204	3/20/78:	DDST = abnormal	Down's syndrome Further diagnosis deferred
205	9/21/78:	No response to testing	Mental retardation Further diagnosis deferred

Subject	Available Test Data	Etiology/Diagnosis
207	2/6/76: Bayley Derived IQ = 20 Vineland SA = 1 yr. 5 mos. SQ = 29	Severe mental retardation Seizure disorder
208	1/6/78: Utah Test of Language Dev. Uscore = 2.6	Mental retardation Seizure disorder Further diagnosis deferred
209	12/20/77: Leiter IQ = 77 Vineland SA = 2.5 SQ = 63	Borderline MR Dyspraxia
210	9/24/75: Bayley Derived IQ = 32 Vineland SA = 12 mos. SQ = 32	Severe MR
211	6/26/78: Stanford Binet IQ = 38	Moderate MR
212	6/8/78: Stanford Binet IQ = retarded Non-verbal Hiskey Nebraska Test borderline	Borderline MR
213	12/28/76: Stanford Binet IQ = 25	Moderate to severe MR
214	3/1/78: Testing incomplete	Diagnosis deferred

Subject	Available Test Data	Etiology/Diagnosis
215	6/26/78: Stanford Binet IQ < 30 (assumed basal)	Severe MR CP Brain damage
218	1/22/75: Bayley Derived IQ = 54 Vineland SA = 2.1 SQ = 71	Mild MR Seizures Delayed speech (Using derived IQ and AAMD classification = moderate MR
219	No date: LAP administered; does not yield score	Moderate to mild MR
220	6/29/78: Stanford Binet IQ = 65 (no basal)	Mental retardation
221	7/11/77: Test not listed IQ = 46	Mental retardation Seizure disorder
222	10/16/78: Denver No score	Down's syndrome Mental retardation
223	9/27/78: Denver Results adjusted to age = normal 6/9/77: Bayley MDI = 67 PDI = 71 Vineland Functioning at 5 mos.	Mental retardation

Appendix D

Social Maturity Rank Protocol
and Scoring Procedure

Date:_____

To:_____

Class:_____

We are seeking your opinion about the "social maturity" of the children in your classroom. First of all, please write your definition of social maturity:_____

_____

_____

Then, please list ALL the children in your class (not just those in the communication study) below, and rank them according to their social maturity. For example, give the most socially mature child a "1," the second most mature child a "2," etc. If there are ties, indicate this by giving more than one child the same number.

Rank or Number:	Name:
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

THANK YOU VERY MUCH FOR ALL OF YOUR COOPERATION.
Please return this form as soon as possible.

Scoring Procedure

N = highest numerical rank given by teacher

T = teacher's rating, or number given to a particular child

R = rating used in analysis, where:

$$R = (N + 1) - T$$

R/N = child's actual social maturity rating relative to the rest of his or her classmates

Appendix E

Sample Permission Letters to Parents

Frank Porter Graham Child Development Center
Highway 54 Bypass West 071 A, Chapel Hill, N.C. 27514 - (919) 966-4121

September, 1978

Dear Parents:

We are conducting a research study on the development of social communication skills in young children. These skills, we believe, are important aspects of children's social awareness and recognition of others. The staff of the Happy Time School has generously extended their cooperation, and we invite the participation of your child in this study.

Children participating in this study will be administered a number of game-like tasks. The results of this study may be useful for future curriculum planning. All parents who wish will receive full explanation of the results of the study and their implications.

In order to allow your child to participate we need your permission to access his/her file to determine such things as (a) the official diagnosis of his/her handicap, and (b) your child's IQ, mental age, developmental level as indicated by test results. This information will be kept strictly confidential. It will be used merely to place children into similar age or ability groups for testing.

If you choose to have your child participate in this study, please circle the appropriate box on the attached form to indicate your consent. Please return the attached form to your child's teacher. We look forward to hearing from you as soon as possible.

Thank you very much.

Sincerely,

Jan Blacher-Dixon
Jan Blacher-Dixon
Research Fellow

Rune J. Simeonsson
Rune J. Simeonsson, Ph.D.
Assistant Director, Research Training Program

JB-D/RJS:jd

Attachment

Frank Porter Graham Child Development Center
Highway 54 Bypass West 071 A, Chapel Hill, N.C. 27514 - (919) 966-4121

☐ I give approval for my child to participate in this study as described.

☐ I do not wish to have my child participate in this study.

Date:_____ Signature:_____

A Division of the Child Development Research Institute, The University of North Carolina at Chapel Hill

Frank Porter Graham Child Development Center
201-A UCUH Plaza, 322A, Chapel Hill, N.C. 27514 (919) 967-8221

January, 1979

Dear Parents:

We are conducting a research study on the development of social communication skills in young children. These skills, we believe are important aspects of children's social awareness and recognition of others. The staff of the Chapel Hill Day Care Center is kindly cooperating with us by allowing us to use their building for this research. We invite the participation of your child in this study, which will begin in February, 1979.

Children participating in this study will be administered a number of game-like tasks involving non-verbal types of communication such as pointing and showing. The complete set of tasks will be administered to each child individually by myself, Jan Blacher-Dixon and my assistant. Previous work has shown that children find these tasks interesting and enjoyable. The length of each session is approximately 30 minutes.

We will need to know your child's birthdate in order to place children into similar age groups for testing. In order to assure that the children participating represent a cross-section of social and economic classes, we will also need to gather information on sex, race, and parent's income from each child's file. This information, collected in code form, will be kept strictly confidential and only used to assure an even distribution of children. You may also withdraw your child from this study at any time.

The results of this study may be useful for future curriculum planning. All parents who wish will receive full explanation of the results of the study and their implications. If you agree to have your child participate in this study, as described above, please check the appropriate box below to indicate your consent, add your signature, and return this form to your child's teacher. We look forward to hearing from you as soon as possible.

Thank you very much for your cooperation.

Sincerely,

Jan Blacher-Dixon
Research Fellow

Rune J. Simeonsson, Ph.D.
Associate Director
Research Training Program

JB-D:RJS/jd

☐ I do not wish to have my child participate in this study.

☐ I give approval for my child to participate in this study as described.

Date:_____ Signature:_____

Appendix F

Description of Tasks and Procedures

Appendix F

Description of Tasks and Procedures*

PERCEPT PRODUCTION

Task 1. Show toy.

The stimulus object for this task was a stuffed bear. The child was handed this toy, with its front toward the child, by the experimenter (E) and asked to show it to the other person (O) who was sitting across from the child. O asked the child, "Can you show me the bear? Can I see the bear?" Various equivalent phrasings were allowed for this, and all, tasks. If the child showed the back of the toy, he/she was asked, "Show me the bear's face" or any equivalent variation. The purpose of this task was to see if the child would make a distinction between giving and showing in general, and secondly, to see if the child would turn the toy to face O.

Tasks 2a and 2b. Show card-picture.

Black and white photographs (approximately 17 x 12 cm) of objects familiar to the child (e.g., a kitty, a doll) were handed to the child with the picture side facing toward him/her. For task 2a the picture was right side up; for task 2b the picture was upside down. The child was asked to show each picture to O who was seated opposite him/her. This and subsequent picture showing tasks were designed to see how capable young children were of showing nonegocentrically, i.e., turning the picture so that the other, but no longer the child himself/herself, could see it.

* Adapted from Lempers, Flavell, & Flavell (1977)

Tasks 3a, 3b, and 3c. Show block picture.

These stimuli were wooden blocks (approximately 5 x 5 x 3 cm), each with a photograph of a familiar object glued onto one of its square faces. Each block had a separate picture; there was a monkey, a girl, and a cartoon character from Sesame Street.

Variation 3a was similar to variation a of task 2; the child was handed a block, picture face toward him, and asked to show the depicted object to O.

In variation 3b, the child was handed a block and asked to show the picture to O, whose eyes were closed. The purpose was to determine if the child understood that closed eyelids prevent a person from seeing. The instructions were the same as in the previous tasks, but if the child made no effort to open O's eyes, O would say, "I can't see the picture" or "Help me see the picture."

Variation 3c was similar to 3b, except that O's eyes were covered with her hands. Thus, O's eyelids constituted a proximal visual obstacle in variation 3b and O's hands play the same role in variation 3c. If the child showed the object without removing the hands, O said, "Oh, I can't see it. Show it to me so I can see the picture," or any equivalent variation.

Task 4. Show cube picture.

The stimulus was a hollow cube, open at one end like a cup (approximately 5 x 5 cm wide and 7 cm deep--hence not literally a "cube"). A photograph of a toy kitten was glued to the inside bottom of the cube. Hence, a child would presumably have had little direct experience showing under these conditions.

Task 5. Show S's back.

The child was facing O and asked to show his/her back to O. The purpose was to see if the child could show something (X) which he/she could only partially see or not see at all, involving his/her own body, to another person who may also become nonvisible in the course of the showing act. Instructions for this task were: "Show me your back" or, "Can I see your back?" If the child pointed to his/her back, the question was again, "Can I see your back?" or any equivalent variation.

Task 6. Show large, immovable object.

O stood with her back to a large, immovable object (e.g., a door) and said to the child, "I want to see the door. Can you show it to me?" The purpose was to see if the child would physically or verbally turn O toward the door (X), if X itself were not movable. The O moved only as far as the child would turn her, adding "I still cannot see it," if not turned far enough. In case of no response, the child was prompted by, "Can you help me see it?" or more explicitly, "Take my hand. Fix me so I can see it." This task required that O be turned to X rather than the opposite, as in most showing situations.

Task 7. Show stick picture.

The apparatus for this task consisted of (1) a round wooden dowel, approximately 60 cm long and 1/2 cm in diameter, and (2) a cardboard cut-out of a rabbit, about 25 cm high. The top of the cut-out was loosely attached near the top end of the dowel. The experimenter had the child hold the dowel near the bottom end, so that the dowel was vertical and the rabbit faced the child. The child was then instructed to show the rabbit to O, seated opposite. The intended solution was to rotate the pole until the rabbit faced O. Like task 4, this task presumably confronted the child with a novel showing problem that could not be solved by any overlearned, rote showing gesture.

Tasks 8a and 8b. Show from behind screen.

In variation 8a, the child was located on one side of a portable screen (almost 2 m high and about 2-1/2 m wide) and O was located on the other side. They could not see each other. The child was asked to show only his hand to O. The purpose was to see if the child could show a seen X (i.e., part of the child himself/herself) to an unseen O. O asked, "Can I see only your hand?" or "Show me your hand, not all of you, only your hand" or any equivalent variation. Variation 8b was virtually identical, except that the child was asked to show the task 7 stick picture rather than his/her hand to the unseen O.

Tasks 9a and 9b. Show on toy panel

The toy panel used in this and other tasks (e.g., 11a, 11b, 15a, 15b) was shown in Figure 1, viewed at an angle from the child's side. Its dimensions are approximately 120 x 30 x 6 cm. The doll, dog, and car are permanently fixed in place on the horizontal board in the positions display in Figure 1. The horizontal support board can slide back and forth, or can be locked and fixed in place; the same is true of the vertical obstacle board. After the child had become familiarized with the operation of the panel, he/she and O sat on the floor, facing each other, with the toy panel between them.

In variation 9a, the support board was freely movable and the obstacle board fixed in place. The child had to show the toys to O by moving the support board. The particular toy the child had to show was initially hidden from O--but visible to the child--by the immobile obstacle board. The purpose of the task was to discover if the child would recognize the presence of an obstacle to O's vision and think to move the toy from behind it by sliding the support board. Instructions were similar to those of earlier tasks. If, after the child moved the horizontal board a little so the toy was still completely hidden, O would say, "I still can't see it--can you show it to me" or, "Fix it so I can see it," or "I want to see it," etc. O was careful not to ask the child to "move" the toy, but would wiggle the support board a little if the child did not respond at all to the instructions. This nonverbal prompt was used in all toy panel tasks.

In variation 9b, the obstacle board was made movable and the support board immobile. Instructions were similar to those of variation 9a.

Task 10. S points.

For this task, O simply said to the child, "Where is the door?" The purpose was to see if the child would point to the object in order to identify its position for O, and also if, while pointing, the child will alternately look at O and the object.

Although this task is not a showing task in the strict sense, it was included in the percept production category for two reasons: (a) pointing is an attention directing gesture and as such certainly percept producing; (b) pointing may be a developmental ancestor of more directed, mature showing.

PERCEPT DEPRIVATION

Tasks 11a and 11b. Hide on toy panel.

This task was the percept deprivation counterpart of tasks 9a and 9b. In variation 9a, the support board was movable and the obstacle board was fixed in place. The objective was to see if the child could hide an object by moving it behind a fixed obstacle. O said, "Can you hide the X (toy) from me?" or any other equivalent variation. If after the child's response the toy was still completely visible O would say, "I can still see the toy and I don't want to see it anymore. Can you hide it?" Or "Make it so I can't see it." As in task 9, O avoided saying anything like, "You move it so I can't see it."

In variation 11b, the obstacle board was movable and the support board fixed. The objective was to see if the child could create a vision-blocking obstacle between O and X. Instructions followed those of 11a.

Task 12. Hide, large immovable object.

This task was the percept deprivation counterpart of task 6. O stood facing a large, immovable object in the room--a door. She then said to the child, "Fix it so I can't see the door," or "Can you hide the door from me?" or "I don't want to see the door anymore. Can you do something?" If the child did not respond, O prompted by saying something like, "Can you take my hand and fix me so I can't see the door?" The task objective was to test the child's ability to "hide" an immobile X from O by moving O rather than X.

Task 13. Hide S.

The child was asked to hide himself/herself from O. Instructions were simply, "Can you hide from me?" or "Go and hide so I can't see you." If the child did not completely hide himself/herself, O would say, "I still can see you--make it so I can't see you."

Task 14. Hide S's hands.

This child was asked to hide his/her hands from O. Unlike the other percept deprivation tasks, X here becomes

nonvisible to the child as well as to O after the hiding act, unless the child turns away from O to hide his/her hands rather than simply putting them behind his/her back.

PERCEPT DIAGNOSIS

Tasks 15a and 15b. O looks.

These tasks utilized the toy panel (see Figure 1) with its three toys, and without its vertical obstacle board. Both O and the child were seated on the floor facing each other, with the toy panel between them. O's eyes were clearly visible to the child. She faced straight ahead, directly towards the child, and closed her eyes. In variation 15a, she then moved her head towards the right-hand or left-hand toy (this choice was random for each subject), and then opened her eyes. Eyes and face therefore pointed in the same direction. O then engaged the child's attention and said, "What toy do I see?" or "Show me the toy I am looking at," or "Point to the toy I see," or simply, "What's that?" If no response, O would say, "Look at me. What toy do I see?"

In variation 15b, O's eyes pointed to the right-hand or left-hand toy, while her head remained oriented toward the middle toy--hence, a directional difference between head and eyes. The task objective was to see whether the child would use the eyes or the face as a cue to what object O was looking at. Instructions were the same as in variation 15a.

Task 16. O points.

While the child's attention was directed elsewhere, O stood facing him/her with her arm fully extended and her index finger pointed toward an object some distance away. (A doll sitting on a small chair, placed about six feet away from the experimenters and the child, was used consistently for this task.) As O looked toward the doll she called the child's name and said, "What's that?" or "Bring me that" (never mentioning the object's name).

Appendix G

Sample Communication Tasks Protocol

ID#_____

NAME_____

A SERIES

TASK 1: SHOW TOY. Hand S toy with its front towards S and ask S to show it to O. O says, "Can you show me the dog?" "Can I see the dog?" "I want to look at the dog." "Show me the dog's face."

NO RESPONSE ___

GIVES ___

SHOWS UNORIENTED ___

SHOWS ORIENTED ___

OTHER:

TASK 2: SHOW CARD PICTURE.

(a) Hand S a black and white photo face side toward him, right side up. Ask S to show it to O, sitting opposite him.

NO RESPONSE ___

GIVES ___

SHOWS HORIZONTALLY ___

SHOWS VERTICALLY, UNORIENTED ___

SHOWS VERTICALLY, RIGHT SIDE UP ___

OTHER:

TASK 2: SHOW CARD PICTURE (CONT.).

(b) Hand S a second photo face side toward him, upside down. S is asked to show it to O.

NO RESPONSE ___

GIVES ___

SHOWS HORIZONTALLY ___

SHOWS VERTICALLY, UNORIENTED ___

SHOWS VERTICALLY, RIGHT SIDE UP ___

OTHER:

TASK 3: SHOW BLOCK PICTURE.

(a) Hand S a block, picture toward him, and ask S to show the picture to O.

NO RESPONSE ___

GIVES ___

SHOWS HORIZONTALLY ___

SHOWS VERTICALLY, UNORIENTED ___

SHOWS VERTICALLY, RIGHT SIDE UP ___

OTHER:

TASK 3: SHOW BLOCK PICTURE (CONT.).

(b) Hand S a block and ask S to show it to O whose eyes are closed. O may say, "I can't see the picture." "Help me see the picture."

NO RESPONSE ___

STARES ___

GIVES ___

OPENS EYES, NO SHOW ___

SHOWS, EYES CLOSED ___

SHOWS CLOSELY, EYES CLOSED ___

OPENS EYES, SHOWS ___

OTHER:

TASK 3: SHOW BLOCK PICTURE (CONT.).

(c) O covers her eyes with her hands. O asks, "Can I see the picture?" If child shows object without removing O's hands, O says, "Show it to me so I can see the picture."

NO RESPONSE ___

STARES ___

GIVES ___

MOVES HANDS, NO SHOW ___

SHOWS, COVERED EYES ___

SHOWS CLOSELY, COVERED EYES ___

PICTURE BETWEEN EYES AND HANDS ___

MOVES HANDS, SHOWS ___

OTHER:

TASK 4: SHOW CUBE PICTURE. Hand S a hollow cube with picture. Ask S to show the picture to O. O may ask, "Can I see the _____?"

NO RESPONSE ___

POINTS ___

GIVES ___

SHOWS CUBE, NOT PICTURE ___

SHOWS PICTURE UNORIENTED ___

SHOWS PICTURE RIGHT SIDE UP ___

OTHER:

TASK 5: SHOW S'S BACK. Do "body parts probe" first. Have S facing O. Ask S to show O his back. O asks, "Show me your back." "Can I see your back?"

NO RESPONSE ___

POINTS TO BACK ___

TURNS BACK ___

OTHER:

TASK 6: SHOW LARGE, IMMOVABLE OBJECT. O sits or stands with her back to the door. O says to S, "I want to see the door." "Can you show it to me?" In the case of no response, O says, "Can you help me see it?" "Take my hand. Fix me so I can see it."

NO RESPONSE ___

POINTS TO OBJECT ___

TURNS O ___

OTHER:

TASK 7: SHOW STICK PICTURE. E has child hold dowel near the bottom end, so that the dowel is vertical and the rabbit faces S. E tells S to show the rabbit to O, who sits opposite S.

NO RESPONSE ___

GIVES ___

SHOWS HORIZONTALLY ___

TURNS PARTIALLY ___

TURNS FULLY ___

OTHER:

TASK 8: SHOW FROM BEHIND SCREEN.

(a) Place S on one side of screen and O on the other side so that they cannot see each other. Ask S to show only his hand to O. O asks, "C I see only your hand?" "Show me just your hand, not all of you, only your hand."

NO RESPONSE ___

REFUSES ___

GOES AROUND AND SHOWS ___

SHOWS AND PEEKS ___

SHOWS HAND ONLY ___

OTHER:

TASK 8: SHOW FROM BEHIND SCREEN (CONT.).

(b) Same as variation (a), but ask S to show O the Task 7 stick picture rather than his hand.

NO RESPONSE ___

GOES AROUND AND SHOWS ___

SHOWS AND PEEKS ___

SHOWS PICTURE ONLY ___

OTHER:

TASK 9: SHOW ON TOY PANEL. Familiarize child with panel. S and O sit facing, with toy panel between them.

(a) Fix obstacle board in place. Ask S to show toy ____ to O by moving support panel. O may say, "I still can't see it--can you show it to me?" "Fix it so I can see it," etc. Nonverbal prompt allowed: O may wiggle support board.

NO RESPONSE ___

POINTS TO OBJECT ___

SLIDES BOARD ___

OTHER:

TASK 9: SHOW ON TOY PANEL (CONT.).

(b) Fix support board in place. Same instructions as above, but use different toy.

NO RESPONSE ___

POINTS TO OBJECT ___

SLIDES BOARD ___

OTHER:

TASK 10: 3 POINTS. O says to S, "Where is the _____?"

NO RESPONSE ___

LOOKS FROM O TO X ___

POINTS AT X ___

POINTS AT X, LOOKS AT O ___

OTHER:

ID#_____

NAME_____

B SERIES

TASK 11: HIDE ON TOY PANEL.

(a) Fix obstacle board in place. O says to S, "Can you hide the _____ from me?" "I don't want to see _____ anymore. Fix it so I can't see it anymore." If partially visible, O says, "I still can see the toy and I don't want to see it anymore. Can you hide it?"

NO RESPONSE ___

SHOWS ___

HIDES ___

OTHER:

TASK 11: HIDE ON TOY PANEL (CONT.).

(b) Fix support board in place. O says, "I don't want to see the _____ anymore. Can you hide it from me?" O points to vertical, obstacle board.

NO RESPONSE ___

SHOWS ___

HIDES ___

OTHER:

TASK 12: HIDE LARGE, IMMOVABLE OBJECT. O faces a large object in the room. O says to S, "Fix it so I can't see the door." "Can you hide the door from me?" "I don't want to see the door anymore." In the case of no response, O may say, "Can you take my hand and fix me so I can't see the door?"

NO RESPONSE ___

REFUSES ___

POINTS TO OBJECT ___

TURNS O ___

CREATES OBSTACLE ___

OTHER:

TASK 13: HIDE S. Ask S to hide himself from O. O says, "Can you hide from me?" "Go and hide so I can't see you." If child only partially hides, O may s.y, "I still can see you--make it so I can't see you."

NO RESPONSE ___

REFUSES ___

HIDES EGOCENTRICALLY ___

HIDES NONEGOCENTRICALLY ___

OTHER:

TASK 14: HIDE S'S HANDS. Ask S to hide his hands from O. (Use same instructions as above.) "Go and hide your hands." "Make it so I can't see your hands."

NO RESPONSE ___

REFUSES ___

SHOWS ___

HIDES ___

OTHER:

ID#_____

NAME_____

C SERIES

TASK 15: O LOOKS.

(a) Place toy panel between O and S. O looks at S directly, then closes her eyes. O moves her head toward the right-hand (or left-hand) toy, and opens her eyes. O says to S, "What toy do I see?" "Show me the toy I am looking at." "Point to the toy I see." "What's that?" If no response, or incorrect response, O says, "Look at me. What toy do I see?"

NO RESPONSE ___

REFUSES ___

LOOKS AT O ___

INCORRECT RESPONSE ___

CORRECT RESPONSE ___

OTHER:

TASK 15: O LOOKS.

(b) O points eyes only to the right-hand (or left-hand) toy, while head remains oriented to the middle toy. Instructions same as above, "What toy do I see?" ?Show me the toy I am looking at," etc.

NO RESPONSE ___

REFUSES ___

LOOKS AT O ___

INCORRECT RESPONSE ___

CORRECT RESPONSE ___

OTHER:

TASK 16: O POINTS. O stands facing S and looking at him with her arm fully extended to the right and her index finger pointed toward some object. Holding this posture, O says, "What's that?" "Bring me that."

NO RESPONSE ___

LOOKS AT FACE ___

LOOKS AT HAND ___

LOOKS TOWARD OBJECT ___

OTHER:

Appendix H

Strategies of 38 Retarded Children:
Tasks 1-23 by Social Age

Task 1 by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	2		
Refused or threw object; pushed it away			1
Other - incorrect			
PARTIAL:			
Gives	4	3	1
Shows unoriented	3	2	
Pushed toward O			
Pointed	2	3	
Other - partial		1	
COMPLETE:			
Shows oriented	5	3	7
Other - correct	1		

Task 2a by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	1	1	
Refused or threw object; pushed it away			
Other - incorrect			
PARTIAL:			
Gives	4	2	
Shows horizontally	2	3	2
Shows vertically, unoriented	1	1	
Pushed toward O	1		
Pointed	3		
Other - partial			
COMPLETE:			
Shows vertically right side up	4	5	7
Other - correct	1		

Task 2b by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	2		
Refused or threw object; pushed it away			
Other - incorrect			
PARTIAL:			
Gives	3	2	
Shows horizontally		5	1
Shows vertically, unoriented	4	1	1
Pushed toward O			
Pointed	3		
Child re-orients picture	1		
Other - partial			
COMPLETE:			
Shows vertically, right side up	4	4	7
Other - correct			

Task 3a by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	1		
Refused in some way			
Other - incorrect			
PARTIAL:			
Gives	4		
Shows horizontally		1	
Shows vertically, unoriented	4	1	
Pushing	1		
Pointed	2		1
Other - partial			
COMPLETE:			
Shows vertically, right side up	5	10	7
Other - correct			1

Task 3b by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	3		
Refused in some way			
Other - incorrect	1		
PARTIAL:			
Stares		1	
Gives	2		1
Opens eyes, no show			
Shows, eyes closed	1	3	1
Shows closely, eyes closed	5	6	2
Pointing	1	1	
Pushed toward O			
Touched or poked at O's hands or eyes			
Other - partial	4	1	1
COMPLETE:			
Opens eyes, shows			1
Child tells O what to do			1
Other - correct			2

Task 3c by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	4		
Refused in some way			
Other - incorrect	1		
PARTIAL:			
Stares		1	
Gives	1		
Moves hands, no show			
Shows, covered eyes		1	1
Shows closely, covered eyes	4	2	1
Picture between hands and eyes		1	
Poked or touched hands to move them			
Pointed	2	1	1
Child covers own eyes	1		
Other - partial	2	3	1
COMPLETE:			
Moves hands, shows	2	2	4
Child tells O what to do		1	
Other - correct			1

Task 4 by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	2	1	
Refused in some way			
Other - incorrect	1		
PARTIAL:			
Points	2		1
Gives	3		
Shows cube, not picture	2		
Shows picture unoriented	3	5	1
Shows cube, open end up			
Other - partial			
COMPLETE:			
Shows picture, right side up	4	6	7
Other - correct			

Task 5 by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	4	2	1
Doesn't know body parts	5		
Refused			
Other - incorrect	1		
PARTIAL:			
Points to back	2	3	1
Needed to be shown O or E's back first			
Other - partial		1	
COMPLETE:			
Turns back	4	5	6
Other - correct	1	1	1

Task 6 by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	8	1	1
Unreliable response	1		
Other - incorrect			
PARTIAL:			
Points to object	2	0	4
Other - partial	4	2	
COMPLETE:			
Turns O	1		4
S walks O to another door			
S commands O			
Other - correct	1	1	

Task 7 by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	4		
Other - incorrect	2	1	
PARTIAL:			
Gives			
Shows horizontally		1	
Turns partially		1	2
Points to bunny	2		
Other - partial	2		
COMPLETE:			
Turns fully	7	9	7
Other - correct			

Task 8a by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	5		
Refuses			
Incorrect	1		
PARTIAL:			
Goes around and shows	2	2	1
Shows and peeks	2	3	2
Peeks through cracks	1		1
Pushes hand up against screen			1
Other - partial	2	2	
COMPLETE:			
Shows hand(s) only	4	5	3
Puts hand(s) through crack			1
Other - correct			

Task 8b by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	6		
Refuses			
Other - incorrect			
PARTIAL:			
Goes around and shows	3	1	1
Shows and peeks	2	2	
Peeks through crack			
Pushes up against screen		1	
Other - partial	2	2	
COMPLETE:			
Shows picture only	4	4	4
Puts rabbit through crack		1	
Puts rabbit over top		1	4
Other - correct			

Task 9a by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	6	1	
Too difficult for child to manipulate			
Unreliable	1	2	
Other - incorrect		1	1
PARTIAL:			
Points to object	7	4	1
Grabs toy; tries to pick it up		1	
Other - partial			1
COMPLETE:			
Slides board	3	2	6
Shows by some other means		1	

Task 9b by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	8	1	
Too difficult for child to manipulate			
Unreliable		3	
Other - incorrect		1	1
PARTIAL:			
Points to object	5	2	3
Grabs toy; tries to pick it up		1	
Other - partial			
COMPLETE:			
Slides board	4	4	5
Shows by some other means			
Other - correct			

Task 10 by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	6	1	
Unreliable	1	1	1
Refuses			
Other - incorrect			
PARTIAL:			
Looks from O to X			
Other - partial	1		
COMPLETE:			
Points at X	2	2	
Points at X, looks at O	7	8	5
Points to screen			
Other - correct			3

Task 11a by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	10	3	
Too difficult to manipulate			
Unreliable		3	
Other - incorrect	1	1	1
PARTIAL:			
Shows	2	1	2
Grabs toy; tries to pick it up		1	
Points	2	1	
Other - partial			
COMPLETE:			
Hides	2	2	5
Hides by some other means			
Other - correct			

Task 11b by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	9	3	1
Too difficult for child to manipulate			
Unreliable	1	3	
Other - incorrect	1		1
PARTIAL:			
Shows	1	1	1
Grabs toy; tries to pick it up		1	
Points	2	1	1
Other - partial			
COMPLETE:			
Hides	3	3	5
Hides by some other means			
Other - correct			

Task 12 by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	10	1	1
Refuses	1	2	
Unreliable			
Other - incorrect	1	1	3
PARTIAL:			
Points to object	2	6	1
Other - partial	1	1	1
COMPLETE:			
Turns O	1	1	1
Creates obstacle	1		
Moves O somewhere			
Pushes hand over O's eyes			
Commands O (to close or cover eyes, etc.)			2
Other - correct			

Task 13 by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	11	1	1
Refuses	1		
Other - incorrect		1	1
PARTIAL:			
Hides egocentrically	1	2	
Other - partial			
COMPLETE:			
Hides nonegocentrically	4	8	7
Other - correct			

Task 14 by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	7	1	
Refuses	1	1	
Shows	4	3	2
Other - incorrect	2	2	3
PARTIAL:			
Hides whole self	2	1	
Other - partial		1	
COMPLETE:			
Hides	1	3	4
Other - correct			

Task 15a by Social Age Level

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	6	1	
Refuses	1		
Incorrect response			
No eye contact			
Other - incorrect			
PARTIAL:			
Looks at O	1		
Other - partial			
COMPLETE:			
Correct response	8	11	9
Other - correct			

Task 15b by Social Age Level.

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	6	1	
Refuses	1		
Incorrect response	3	2	2
No eye contact	2		2
Other - incorrect			
PARTIAL:			
Looks at O			
Other - partial			
COMPLETE:			
Correct response	5	9	5
Other - correct			

Task 16 by Social Age Level.

Strategies	Social Age Level		
	Two (N = 17)	Three (N = 12)	Four (N = 9)
NO CREDIT:			
No response	1		
No eye contact			
Other - incorrect			
PARTIAL:			
Looks at face			
Looks at hand	1	1	
Other - partial			
COMPLETE:			
Looks toward object	14	11	9
Other - correct	1		

Appendix I

Strategies of 61 Nonretarded Children:
Tasks 1-23 by Social Age

Task 1 by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	1		
Refused or threw object; pushed it away			
Other - incorrect			
PARTIAL:			
Gives	6	3	1
Shows unoriented	5	6	5
Pushed toward O	1		
Pointed	2		1
Other - partial		1	
COMPLETE:			
Shows oriented	3	1	25
Other - correct			

Task 2a by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response			
Refused or threw object; pushed it away	1		
Other - incorrect			
PARTIAL:			
Gives	4	1	
Shows horizontally	7		2
Shows vertically, unoriented	1	2	3
Pushed toward O	1		
Pointed	1		
Other - partial			
COMPLETE:			
Shows vertically right side up	3	8	27
Other - correct			

Task 2b by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response			
Refused or threw object; pushed it away	1		
Other - incorrect	1		
PARTIAL:			
Gives	4	1	
Shows horizontally	5		2
Shows vertically, unoriented	3	5	2
Pushed toward O			
Pointed	2		
Child re-orients picture			
Other - partial			
COMPLETE:			
Shows vertically, right side up	2	5	28
Other - correct			

Task 3a by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	1		
Refused in some way			
Other - incorrect			
PARTIAL:			
Gives	5	1	
Shows horizontally			1
Shows vertically, unoriented	4	2	4
Pushing			
Pointed	5		
Other - partial			
COMPLETE:			
Shows vertically, right side up	3	8	27
Other - correct			

Task 3b by Social Age Level.

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	2		
Refused in some way			
Other - incorrect			
PARTIAL:			
Stares	2		
Gives	1	1	1
Opens eyes, no show			
Shows, eyes closed	4	2	
Shows closely, eyes closed		6	6
Pointing	8		
Pushed toward O			
Touched or poked at O's hands or eyes			
Other - partial	1		1
COMPLETE:			
Opens eyes, shows			
Child tells O what to do		2	24
Other - correct			

Task 3c by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	1		
Refused in some way	1		
Other - incorrect			
PARTIAL:			
Stares	1	2	1
Gives	1		
Moves hands, no show			
Shows, covered eyes	2	1	1
Shows closely, covered eyes	5	4	3
Picture between hands and eyes			
Poked or touched hands to move them			
Pointed	7	1	
Child covers own eyes			
Other - partial			
COMPLETE:			
Moves hands, shows		1	13
Child tells O what to do		2	13
Other - correct			

Task 4 by Social Age Level.

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	2		
Refused in some way			
Other - incorrect			
PARTIAL:			
Points	5		
Gives	1		
Shows cube, not picture	2	1	
Shows picture unoriented	5	5	5
Shows cube, open end up			
Other - partial	1		
COMPLETE:			
Shows pictures, right side up	2	5	27
Other - correct			

Task 5 by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	4		1
Doesn't know body parts	1		
Refused		1	1
Other - incorrect			
PARTIAL:			
Points to back	5	3	3
Needed to be shown O or E's back first	3		
Other - partial			1
COMPLETE:			
Turns back	5	7	26
Other - correct			

Task 6 by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	4	3	2
Unreliable response	2		
Other - incorrect			
PARTIAL:			
Points to object	11	4	4
Other - partial	1		
COMPLETE:			
Turns O		2	14
S walks O to another door			
S commands O		2	12
Other - correct			

Task 7 by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	4		
Other - incorrect			
PARTIAL:			
Gives	2		
Shows horizontally		1	
Turns partially	6	1	3
Points to bunny	3		
Other - partial			
COMPLETE:			
Turns fully	2	9	29
Other - correct	1		

Task 8 by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	2		1
Refuses			
Incorrect	1		
PARTIAL:			
Goes around and shows	12	5	6
Shows and peeks	1	2	5
Peeks through cracks			
Pushes hand up against screen			1
Other - partial		1	2
COMPLETE:			
Show hand(s) only	2	2	16
Puts hand(s) through crack		1	1
Other - correct			

Task 8b by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	2		
Refuses			
Other - incorrect	1		
PARTIAL:			
Goes around and shows	11	6	5
Shows and peeks	1	1	4
Peeks through crack			
Pushes up against screen			1
Other - partial	2		1
COMPLETE:			
Shows picture only	1	3	18
Puts rabbit through crack		1	1
Puts rabbit over top			2
Other - correct			

Task 9a by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	4	2	
Too difficult for child to manipulate			
Unreliable			
Other - incorrect			
PARTIAL:			
Points to object	7	1	
Grabs to · tries to pick it [illegible]	1		
Other - partial			1
COMPLETE:			
Slides [illegible]	6	8	31
Showed by some other means			

Task 9b by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	6	1	
Too difficult for child to manipulate			
Unreliable			
Other - incorrect			
PARTIAL:			
Points to object	6		
Grabs toy; tries to pick it up	1		
Other - partial			
COMPLETE:			
Slides board	5	10	32
Showed by some other means			
Other - correct			

Task 10 b. Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	5		
Unreliable			
Refuses			
Other - incorrect			1
PARTIAL:			
Looks from O to X	2		
Other - partial			
COMPLETE:			
Points at X	4	3	8
Points at X, looks at O	7	8	26
Points to screen			
Other - correct			1

Task 11a by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	14	2	
Too difficult to manipulate			
Unreliable		1	
Other - incorrect			
PARTIAL:			
Shows	3	2	1
Grabs toy; tries to pick it up			
Points			
Other - partial			
COMPLETE:			
Hides	1	6	30
Hides by some other means			1
Other - correct			

Task 11b by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	13	1	
Too difficult for child to manipulate			
Unreliable	1		
Other - incorrect			
PARTIAL:			
Shows	1	1	1
Grabs toy; tries to pick it up			
Points	1		
Other - partial		1	1
COMPLETE:			
Hides	2	8	30
Hides by some other means			
Other - correct			

Task 12 by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	15	4	3
Refuses		2	5
Unreliable			
Other - incorrect		1	5
PARTIAL:			
Points to object	3	3	2
Other - partial			4
COMPLETE:			
Turns O			7
Creates obstacle			
Moves O somewhere		1	
Pushes hand over O's eyes			
Commands O (to close or cover eyes, etc.)			4
Other - correct			2

Task 13 by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	14	4	
Refuses		1	1
Other - incorrect	2		1
PARTIAL:			
Hides egocentrically	1	1	3
Other - partial			1
COMPLETE:			
Hides nonegocentrically	1	5	26
Other - correct			

Task 14 by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	7	1	
Refuses		1	2
Shows	7	2	1
Other - incorrect	2	1	
PARTIAL:			
Hides whole self			
Other - partial			
COMPLETE:			
Hides	2	6	29
Other - correct			

Task 15a by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	3	1	
Refuses			
Incorrect response			
No eye contact			
Other - incorrect			
PARTIAL:			
Looks at O			
Other - partial			
COMPLETE:			
Correct response	15	10	32
Other - correct			

Task 15b by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	3	1	
Refuses	1		
Incorrect response	4	2	2
No eye contact			
Other - incorrect			
PARTIAL:			
Looks at O		1	
Other - partial			
COMPLETE:			
Correct response	10	7	30
Other - correct			

Task 16 by Social Age Level

Strategies	Social Age Level		
	Two (N = 18)	Three (N = 11)	Four (N = 32)
NO CREDIT:			
No response	2	2	
No eye contact			
Other - incorrect			
PARTIAL:			
Looks at face			
Looks at hand			
Other - partial			
COMPLETE:			
Looks toward object	16	9	32
Other - correct			

Appendix J

Strategies of 61 Nonretarded Children: Tasks 1-33 by Chronological Age

Task 1 by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	1		
Refused or threw object; pushed it away			
Other - incorrect			
PARTIAL:			
Gives	7	3	
Shows unoriented	6	5	5
Pushed toward O	1		
Pointed	2	1	
Other - partial		1	
COMPLETE:			
Shows oriented	2	8	19
Other - correct			

Task 2a by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT			
No response			
Refused or threw object; pushed it away	1		
Other - incorrect			
PARTIAL:			
Gives	5		
Shows horizontally	7		2
Shows vertically, unoriented		4	2
Pushed toward O	1		
Pointed	1		
Other - partial			
COMPLETE:			
Shows vertically right side up	4	14	20
Other - correct			

Task 2b by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response			
Refused or threw object; pushed it away	1		
Other - incorrect	1		
PARTIAL:			
Gives	5		
Shows horizontally	5	1	1
Shows vertically, unoriented	4	4	2
Pushed toward O			
Pointed	2		
Child re-orients picture			
Other - partial			
COMPLETE:			
Shows vertically, right side up	1	13	21
Other - correct			

Task 3a by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	1		
Refused in some way			
Other - incorrect			
PARTIAL:			
Gives	5	1	
Shows horizontally			1
Shows vertically, unoriented	4	3	3
Pushing			
Pointed	5		
Other - partial			
COMPLETE:			
Shows vertically, right side up	4	14	20
Other - correct			

Task 3b by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	2		
Refused in some way			
Other - incorrect			
PARTIAL:			
Stares	2		
Gives	2		1
Opens eyes, no show			
Shows, eyes closed	4	2	
Shows closely, eyes closed	1	7	4
Pointing	7	1	
Pushed toward O			
Touched or poked at O's hands or eyes			
Other - partial	1	1	
COMPLETE:			
Opens eyes, shows		7	
Child tells O what to do			19
Other - correct			

Task 3c by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	1		
Refused in some way	1		
Other - incorrect			
PARTIAL:			
Stares	1	2	1
Gives	1		
Moves hands, no show			
Shows, covered eyes	3	1	
Shows closely, covered eyes	5	5	2
Picture between hands and eyes			
Poked or touched hands to move them			
Pointed	7	1	
Child covers own eyes			
Other - partial			
COMPLETE:			
Moves hands, shows		6	8
Child tells O what to do		2	13
Other - correct			

Task 4 by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	2		
Refused in some way			
Other - incorrect			
PARTIAL:			
Points	5		
Gives	1		
Shows cube, not picture	3		
Shows picture unoriented	4	7	4
Shows cube, open end up			
Other - partial	1		
COMPLETE:			
Shows picture, right side up	3	11	20
Other - correct			

Task 5 by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	4	1	
Doesn't know body parts	1		
Refused		1	1
Other - incorrect			
PARTIAL:			
Points to back	6	4	1
Needed to be shown O or E's back first	2	1	
Other - partial			1
COMPLETE:			
Turns back	6	11	21
Other - correct			

Task 6 by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	5	3	1
Unreliable response	2		
Other - incorrect			
PARTIAL:			
Points to object	12	6	1
Other - partial		1	
COMPLETE:			
Turns O		6	10
S walks O to another door			
S commands O		2	12
Other - correct			

Task 7 by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	4		
Other - incorrect			
PARTIAL:			
Gives	2		
Shows horizontally		1	
Turns partially	6	1	3
Points to bunny	3		
Other - partial			
COMPLETE:			
Turns fully	3	16	21
Other - correct	1		

Task 8a by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	2		1
Refuses			
Incorrect	1		
PARTIAL			
Goes around and shows	11	11	1
Shows and peeks	1	4	3
Peeks through cracks			
Pushes hand up against screen			1
Other - partial	1	1	1
COMPLETE:			
Shows hand(s) only	2	2	16
Puts hand(s) through crack	1		1
Other - correct			

Task 8b by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	2		
Refuses			
Other - incorrect	1		
PARTIAL:			
Goes around and shows	11	10	1
Shows and peeks	1	3	2
Peeks through crack			
Pushes up against screen			1
Other - partial	2		1
COMPLETE:			
Shows picture only	2	5	15
Puts rabbit through crack			2
Puts rabbit over top			2
Other - correct			

Task 9a by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 19)	Four (N = 24)
NO CREDIT:			
No response	5	1	
Too difficult for child to manipulate			
Unreliable			
Other - incorrect			
PARTIAL:			
Points to object	7	1	
Grabs toy; tries to pick it up	1		
Other - partial			1
COMPLETE:			
Slides board	6	16	23
Showed by some other means			

Task 9b by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	7		
Too difficult for child to manipulate			
Unreliable			
Other - incorrect			
PARTIAL:			
Points to object	5	1	
Grabs toy; tries to pick it up	1		
Other - partial			
COMPLETE:			
Slides board	6	17	24
Showed by some other means			
Other - correct			

Task 10 by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	5		
Unreliable			
Refuses			1
Other - incorrect			
PARTIAL:			
Looks from O to X	1	1	
Other - partial			
COMPLETE:			
Points at X	5	2	4
Points at X, looks at O	8	15	18
Points to screen			
Other - correct			1

Task 11a by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	14	2	
Too difficult to manipulate			
Unreliable		1	
Other - incorrect			
PARTIAL:			
Shows	3	3	
Grabs toy; tries to pick it up			
Points			
Other - partial			
COMPLETE:			
Hides	2	12	23
Hides by some other means			1
Other - correct			

Task 11b by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	14		
Too difficult for child to manipulate			
Unreliable		1	
Other - incorrect			
PARTIAL:			
Shows	1	2	
Grabs toy; tries to pick it up			
Points	1		
Other - partial		2	
COMPLETE:			
Hides	3	13	24
Hides by some other means			
Other - correct			

Task 12 by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	16	5	1
Refuses		3	4
Unreliable			
Other - incorrect		2	4
PARTIAL:			
Points to object	3	4	1
Other - partial		2	2
COMPLETE:			
Turns O		1	6
Creates obstacle			
Moves O somewhere			1
Pushes hand over O's eyes			
Commands O (to close or cover eyes, etc.)		1	3
Other - correct			2

Task 13 by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	14	4	
Refuses		2	
Other - incorrect	2	1	
PARTIAL:			
Hides egocentrically	2	1	2
Other - partial		1	
COMPLETE:			
Hides nonegocentrically	1	9	22
Other - correct			

Task 14 by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	8		
Refuses		1	2
Shows	6	4	
Other - incorrect	2	1	
PARTIAL:			
Hides whole self			
Other - partial			
COMPLETE:			
Hides	3	12	22
Other - correct			

Task 15a by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	3	1	
Refuses			
Incorrect response			
No eye contact			
Other - incorrect			
PARTIAL:			
Looks at O			
Other - partial			
COMPLETE:			
Correct response	16	17	24
Other - correct			

Task 15b by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	3	1	
Refuses	1		
Incorrect response	5	2	1
No eye contact			
Other - incorrect			
PARTIAL:			
Looks at O		1	
Other - partial			
COMPLETE:			
Correct response	10	14	23
Other - correct			

Task 16 by Chronological Age Level

Strategies	Chronological Age Level		
	Two (N = 19)	Three (N = 18)	Four (N = 24)
NO CREDIT:			
No response	2	2	
No eye contact			
Other - incorrect			
PARTIAL:			
Looks at face			
Looks at hand			
Other - partial			
COMPLETE:			
Looks toward object	17	16	24
Other - correct			

Appendix K

Information on the
Vineland Social Maturity Scale

INFORMATION ON THE
VINELAND SOCIAL MATURITY SCALE

The manual pertaining to the Vineland Social Maturity Scale (Doll, 1953) contains a thorough account of the following: (1) description of the scale, including information on its construction and procedures for administration; (2) standardization and validation data; and (3) applications of the scale to various populations. Specific points of interest which are relevant to the use of the Vineland Social Maturity Scale (VSMS) in the present study will be reviewed below. Doll (1953) defines social competence as "a functional composite of human traits which subserves social usefulness as reflected in self-sufficiency and in service to others" (p. 2). As such, the VSMS offers a means of investigating the constituent variables of social competence. Such variables include self-help, locomotion, occupation, communication, self-direction, and socialization skills.

The normative standardization of the VSMS was based on a sample of 620 subjects selected from the Greater Vineland, New Jersey, area. The group included 10 male and 10 female white subjects at each life age from birth to 30 years of age. This sample did not include children with grave educational retardation, mental deficiency, or limiting

handicaps, and children of various nationalities were selected according to their community representation. (The actual normative results for each scale item are contained in tables in Chapter 9).

Several statistical cautions pertaining to the standardization data are pointed out by Doll (1953). Specifically, the number of subjects included is relatively small which sets some limits on the generalizability of the findings. Random sampling of subjects did not take place; instead, "controlled samples" were selected in order to study social competence in relatively small homogeneous groups. Hence, Doll actually asserts that "certain statistical procedures are dubiously applicable" (p. 388).

The general information of the VSMS contained below is taken directly from the 1965 Condensed Manual of Directions:

> The central purpose of each item of the Scale is to represent some particular aspect of the ability to look after one's own practical needs. The specific items aim to sample such various aspects of social ability as self-sufficiency, occupational activities, communication, self-direction, and social participation, and to reflect progressive freedom from need of assistance, direction, or supervision on the part of others. The items aim to avoid measuring intelligence, skill, achievement, personality, emotionality, and the specific results of environmental opportunity, training, incentive, habit, and so on, as such. The influence of such factors is expressed in terms of their composite capitalization for socially independent behavior.
>
> To facilitate administration of the Scale, the detailed items are roughly grouped according to general similarity of content. However, each item is to be understood as a measure of general social maturation. By grouping similar items in categorical hierarchies the examiner is able to apply the scale with more facility, thus quickly appraising the position of the subject examined in respect to each of these major aspects of social competence.
>
> Each item of the scale has a growth span of several years from which an average age may be derived as a standard for purposes of scaling, the maturation curve as a whole reflecting individual differences in development. The results from the sum of items passed by a given subject are then reduced to age scores according to the average performance of normative life-age groups. These average scores are indicated by separating the items into year groups as total scores. The items of the Scale are to be scored on the basis of information obtained from someone intimately familiar with the person scored, such as the mother, the father, a close relative, guardian, attendant, or supervisor (pp. 7-8).

A sample scoring form for the VSMS is included in this Appendix. The items are clearly grouped into general age periods, ranging from 0-1 to 25+ years, with each age period including items from several skill categories. Hence, it is possible to glean an idea of the competencies appropriate for each age by examining the protocol. As can be seen from the scoring form, a child whose social age is in the two year range may play with other children, use names of familiar objects, eat with a spoon, get a drink unassisted, initiate her/his own play activities, etc. A child whose social age is in the three year range may accomplish such things as eating with a fork, relating experiences, or playing cooperatively. Finally, a child at the approximate social age level of four may typically "perform" for others, wash her/his hands unaided, help at little household tasks,

and care for her/himself at toilet.

Total scores from the Vineland Social Maturity Scale may be converted to equivalent social age values by referring to the table contained in the manual. Doll (1953) notes that the final score obtained should be interpreted with special caution under circumstances involving crippling, ill health, sensory defects, or other barriers to opportunity. However, limitations due to intelligence level, emotional attitudes, or social conditioning, for example, are presumed to be reflected in the Scale itself.

In the present study, the Vineland Social Maturity Scale is used to obtain an estimate of the developmental status of the children included in this study. For all subjects, social ages (SA) and social quotients (SQ) were obtained using teachers as informants. Since the communication tasks used in this study are believed to be social in nature, subjects were grouped according to SA for descriptive purposes and SA scores were correlated with communication task total and sub-group scores.

AGS Vineland Social Maturity Scale

BY EDGAR A. DOLL, Ph.D.

NAME ..... (Last, First) Sex ..... Grade ..... Date ..... (Year, Month, Day)

Residence ..... School ..... Born ..... (Year, Month, Day)

M.A. ..... I.Q. ..... Test Used ..... When ..... Age ..... (Years, Months, Days)

Occupation ..... Class ..... Years Exp. ..... Schooling .....

Father's Occupation ..... Class ..... Years Exp. ..... Schooling .....

Mother's Occupation ..... Class ..... Years Exp. ..... Schooling .....

Informant ..... Relationship ..... Recorder .....

Informant's est. ..... Basal Score* .....

Handicaps ..... Additional pts. .....

REMARKS: Total score .....

Age equivalent .....

Social quotient .....

Age Periods

0 -

Category†	Score*	Items	LA Mean
C	1.	"Crows"; laughs	.25
SHG	2.	Balances head	.25
SHG	3.	Grasps objects within reach	.30
S	4.	Reaches for familiar persons	.30
SHG	5.	Rolls over	.30
SHG	6.	Reaches for nearby objects	.35
O	7.	Occupies self unattended	.43
SHG	8.	Sits unsupported	.45
SHG	9.	Pulls self upright	.55
C	10.	"Talks"; imitates sounds	.55
SHE	11.	Drinks from cup or glass assisted	.55
L	12.	Moves about on floor	.63
SHG	13.	Grasps with thumb and finger	.65
S	14.	Demands personal attention	.70
SHG	15.	Stands alone	.85
SHE	16.	Does not drool	.90
C	17.	Follows simple instructions	.93

† Key to categorical arrangement of items:
S H G — Self-help general; C — Communication; L — Locomotion
S H D — Self-help dressing; S D — Self-direction; O — Occupation
S H E — Self-help eating; S — Socialization

* For method of scoring see "The Measurement of Social Competence."

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I - II

L	18. Walks about room unattended	1.03
O	19. Marks with pencil or crayon	1.10
SHE	20. Masticates food	1.10
SHD	21. Pulls off socks	1.13
O	22. Transfers objects	1.20
SHG	23. Overcomes simple obstacles	1.30
O	24. Fetches or carries familiar objects	1.38
SHE	25. Drinks from cup or glass unassisted	1.40
SHG	26. Gives up baby carriage	1.43
S	27. Plays with other children	1.50
SHE	28. Eats with spoon	1.53
L	29. Goes about house or yard	1.63
SHE	30. Discriminates edible substances	1.65
C	31. Uses names of familiar objects	1.70
L	32. Walks upstairs unassisted	1.75
SHE	33. Unwraps candy	1.85
C	34. Talks in short sentences	1.95

II - III

SHG	35. Asks to go to toilet	1.98
O	36. Initiates own play activities	2.03
SHD	37. Removes coat or dress	2.05
SHE	38. Eats with fork	2.35
SHE	39. Gets drink unassisted	2.43
SHD	40. Dries own hands	2.60
SHG	41. Avoids simple hazards	2.85
SHD	42. Puts on coat or dress unassisted	2.85
O	43. Cuts with scissors	2.88
C	44. Relates experiences	3.15

III - IV

L	45. Walks downstairs one step per tread	3.23
S	46. Plays cooperatively at kindergarten level	3.28
SHD	47. Buttons coat or dress	3.35
O	48. Helps at little household tasks	3.55
S	49. "Performs" for others	3.75
SHD	50. Washes hands unaided	3.83

IV - V

SHG	51. Cares for self at toilet	3.83
SHD	52. Washes face unassisted	4.65
L	53. Goes about neighborhood unattended	4.70
SHD	54. Dresses self except tying	4.80
O	55. Uses pencil or crayon for drawing	5.13
S	56. Plays competitive exercise games	5.13

V - VI

O	57. Uses skates, sled, wagon	5.13
C	58. Prints simple words	5.23
S	59. Plays simple table games	5.63
SD	60. Is trusted with money	5.83
L	61. Goes to school unattended	5.83

VI - VII

SHE	62. Uses table knife for spreading	6.03
C	63. Uses pencil for writing	6.15
SHD	64. Bathes self assisted	6.23
SHD	65. Goes to bed unassisted	6.75

VII - VIII

SHG	66. Tells time to quarter hour	7.28
SHE	67. Uses table knife for cutting	8.05
S	68. Disavows literal Santa Claus	8.28
S	69. Participates in pre-adolescent play	8.28
SHD	70. Combs or brushes hair	8.45

VIII - IX

O	71. Uses tools or utensils	8.50
O	72. Does routine household tasks	8.53
C	73. Reads on own initiative	8.55
SHD	74. Bathes self unaided	8.85

IX - X

SHE	75. Cares for self at table	9.03
SD	76. Makes minor purchases	9.38
L	77. Goes about home town freely	9.43

X - XI

C	78. Writes occasional short letters	9.63
C	79. Makes telephone calls	10.30
O	80. Does small remunerative work	10.90
C	81. Answers ads; purchases by mail	11.20

XI - XII

O	82. Does simple creative work	11.25
SD	83. Is left to care for self or others	11.45
C	84. Enjoys books, newspapers, magazines	11.58

XII - XV

S	85. Plays difficult games	12.30
SHD	86. Exercises complete care of dress	12.38
SD	87. Buys own clothing accessories	13.00
S	88. Engages in adolescent group activities	14.10
O	89. Performs responsible routine chores	14.65

XV - XVIII

C	90.	Communicates by letter	14.95
C	91.	Follows current events	15.35
L	92.	Goes to nearby places alone	15.85
SD	93.	Goes out unsupervised daytime	16.13
SD	94.	Has own spending money	16.53
SD	95.	Buys all own clothing	17.37

XVIII - XX

L	96.	Goes to distant points alone	18.05
SD	97.	Looks after own health	18.48
O	98.	Has a job or continues schooling	18.53
SD	99.	Goes out nights unrestricted	18.70
SD	100.	Controls own major expenditures	19.68
SD	101.	Assumes personal responsibility	20.53

XX - XXV

SD	102.	Uses money providently	21.5+
S	103.	Assumes responsibility beyond own needs	21.5+
S	104.	Contributes to social welfare	25+
SD	105.	Provides for future	25+

XXV+

O	106.	Performs skilled work	25+
O	107.	Engages in beneficial recreation	25+
O	108.	Systematizes own work	25+
S	109.	Inspires confidence	25+
S	110.	Promotes civic progress	25+
O	111.	Supervises occupational pursuits	25+
SD	112.	Purchases for others	25+
O	113.	Directs or manages affairs of others	25+
O	114.	Performs expert or professional work	25+
S	115.	Shares community responsibility	25+
O	116.	Creates own opportunities	25+
S	117.	Advances general welfare	25+

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